The Builder.

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On the Value of Symmetry and Design.

THE Greek verb *συμ-μετρέω* has for its literal meaning "to measure one thing by another," more literally "to measure together"; and the corresponding adjective, *σύμμετρος*, signifies "of like measure or size with." It is only when we come to the substantive derived from this, *συμμετρία*, that we find the word in the more general signification which we attach to it in common parlance, as signifying generally pleasing proportion of parts and outline of form. But the more literal and restricted sense, as indicating that in which one part is measured from, and is a repetition of another, is undoubtedly the original sense of the compound word; and as we have no single word in English to express this likeness between parts, it is convenient to use the word "symmetry" sometimes in its narrower meaning, as indicating repetition of parts on each side of the centre line, in any artistic composition or ornament.

In speaking of the "value" of symmetry, considered in this sense, we are not assuming that a symmetrical treatment is in all cases desirable, but proposing to consider how far it is an essential element in architectural and ornamental design, and whether or not it is a characteristic of the highest class of design; both sides of the proposition having been respectively asserted in a pretty positive manner by critics of different schools. By one writer absolute symmetry is regarded as the necessary concomitant of any complete and artistic ornament; by another it is decried as a mere mechanical and soulless method of treatment, substituting "vain repetitions" for thoughtful elaboration of work.

This latter view is generally backed by an appeal to Nature,—to the endless variety in natural vegetation, &c.; and if we compare the productions of architecture and its tributary arts with the works of inanimate nature, the contrast in regard to this matter of symmetry is certainly remarkable. The objects we are accustomed to regard as beautiful in the latter are in almost every case characterised by utter absence of symmetry; the constituent elements in a landscape are utterly irregular, whether in detail or in combination; no plant, and scarcely even a leaf or a flower, is absolutely symmetrical, though they both approach, in some cases, very closely to this condition. But, on the other hand, the almost universal consent of mankind so far (with one or two exceptions to be noted hereafter) has been for more or less symmetrical treatment in ornament; in most cases absolute symmetry, in nearly all cases a symmetry more formal and precise than anything found in natural growths. There appears to be little connexion, either, between these symmetrical tendencies and a high state of civilisation or intellectual culture. If we compare the carving on the canoe or paddle of a New Zealander with the design on a Greek vase, we find, though the former is far less refined in line and execution, almost the same importance is attached in both to the symmetrical treatment of each half of an object, and of the ornament worked on it; and throughout the intermediate links between barbarism and civilisation there is apparent, in the characteristic ornament of each nation, the same principle (or habit) of reduplication and balance.

It is the consideration of this constant recurrence of the symmetrical principle in almost all schools of design which has doubtless led, in great measure, to the exaggerated estimate of the value of this element in ornament taken by some critical writers. It has been asserted that reduplication is the very essence and foundation of ornament; and a favourite example is the result produced by marking any form on a piece of paper and folding it over while the ink is wet, so as to produce a corresponding opposite impression. Here, it has been asserted, is the rough genesis of ornament; a form which was without meaning or beauty when first sketched, becomes "ornamental," and acquires a sense and purpose the moment it is shown as a symmetrical repetition. This is an extreme statement of the case, which, however, we met with not long since in a book put forth by an official instructor in art. It would not require much research, certainly, to find examples to set against so general a statement; specimens of beautiful but unsymmetric ornament of the Mediæval school could be at once adduced; and it is quite possible to produce exceedingly ugly would-be ornament in the strictest duplicate symmetry. The part which symmetry really plays in ornament consists in supplying the evidence of law and of design. The evidence of law, the relation of parts to a fixed purpose, in nature, depends upon minutiæ far more numerous, various, and delicate than anything which man's handiwork can attain to or imitate; nor would such imitation, if attained, be sufficiently subordinate or quiescent in expression to serve as appropriate ornament to anything so artificial as a building. But the principle of symmetrical opposition, suggested by nature in the growth of vegetation from a central stem, and carried out further and more completely in the higher forms of life, furnishes the readiest and most recognisable means of imprinting on man's artificial work the expression of law, and of a fixed intent governing his productions. Mere imitation of nature in her thousand irregularities, wants this expression of law, because we can after all only produce an imperfect imitation of certain details, which fail to exhibit any but a very small suggestion of the great physical laws of the world; we have therefore to make to ourselves a smaller and more easily defined law, which we can illustrate in the compass of a panel, or a ceiling, or a frieze; and it is only the ornament composed according to such an obvious readily comprehended law which has been regarded by mankind as of permanent value in its own class, and as matter for study and admiration. Mere knots, festoons, Grinling Gibbons carvings, and such matters, are of interest historically, but not artistically, except as to mere power of handiwork.

This expression of law and design through symmetry may be obtained, however, either by the employment of forms and details absolutely symmetrical in themselves, as in the Greek honeysuckle ornament, of which each section consists of two similar halves; or by the use of a form not symmetrical in itself, but giving the effect of symmetry by repetition. This is exemplified in much of the best Gothic ornament, especially in illuminated border designs. And we may take, again, a well-known example from the Greek, the "key" pattern, no portion of which is strictly symmetrical, but which runs in a symmetrical sequence. The radical distinction between these two forms of symmetry and their expression, is, that the last-named (the repetition form) always indicates movement,—a tendency in one direction, while the other indicates repose Each portion here is complete in itself, and could in a suitable position be used alone. No section of the other form can be used alone, for it absolutely depends for its motive on the parts preceding and following it. The greatest stateliness and sumptuousness of ornament belongs to the repetition of forms complete in themselves; the greatest life and piquancy to forms which are interpendent and only symmetrical in their juxtaposition. This is an important and wide principle, which in the main decides which type of ornament is suited to any given building, room, or situation. Where the mass of the building is severely symmetrical, the ornament must be in keeping with it, and must not assume, by the introduction of too many unsymmetrical forms, a liveliness and piquancy out of keeping with the structure which it adorns. Where the main building is unsymmetrical, romantic, "picturesque," in type, the ornament may display the tendency to movement and life which the use of unsymmetrical forms in connexion furnishes. Palatial state and luxury is best adorned and embroidered by symmetrical ornament; the drawing-room and boudoir, on the other hand, are better illustrated by the less rigid types of running ornament, approaching more to the life and vivacity of nature; and this is the more true, inasmuch as the strictly symmetrical type of ornament, in order to tell and produce its full effect, requires both careful and exact execution and considerable richness and elaboration; the repeating style of ornament, less stately and more piquant, is satisfactory in simpler forms, and with less perfect execution; any imperfections in the latter point being far less marked than in the case of decorative features which profess to be precisely and mathematically similar on each side of their centre. We have here been supposing the case of buildings in the same style, but intended for different uses. It might be said that the buildings for the most solemn uses in the Gothic style contain a good deal of totally unsymmetrical ornament; but if we compare styles with one another, we shall find that in most of the successful styles of the world, the relation between the symmetry of the building and of its decoration is kept up. In the pure and rigidly defined Greek building we have the greatest proportion of strictly symmetrical ornament; in the Gothic, which is much less restricted in general composition, there is a similar departure from uniformity in ornament; but in the earlier stages of the Gothic, when the logical development of the plan and construction of the building was more strictly observed, the ornament also (in French Gothic especially) is largely governed by symmetrical disposition; it is only in the florid decadence of the style that the freedom and irregularity of nature are affected in the ornamental details.

In addition to the two types just mentioned, and which are illustrated chiefly in ornament arranged in longitudinal or vertical lines, there is a more subtle and ingenious combination of symmetrical effect with variety, which is possible in ornament designed to fill spaces and angles. In such positions the remark as to the superior stateliness and sumptuousness of perfectly symmetrical ornament still holds good in the main, and the practice of mankind in general has ratified it. But a more interesting and more piquant treatment is that in which a symmetrical arrangement of the leading points and outline is adhered to, but the connexion between them,—the manner of passing from one point to another,—is varied. This is what gives much of its charm to the beautiful school of Moorish

and Arabic ornament, where we see a centre or a spandrel filled with what at a first glance appears to be an elaborate symmetrical design, but which on closer inspection is discovered to be studiously varied in the details of its construction, while preserving a perfect balance of the main portions and forms. A remarkable though very simple instance of this school of design, this symmetry produced unsymmetrically, is shown in the small centre-piece of mosaic inlay given by Sir Digby Wyatt among his sketches in Spain: it is typical of the whole principle and genesis of this style of ornament. The intellectual interest of this style of treatment, when well carried out, is considerable, and its accomplishment, on at all an elaborate scale, demands more trouble and thought than most other methods of decorative design; its drawback is that it is apt to degenerate, and with its inventors did at times degenerate, into mere artifice and ingenuity; the thoughts of the designer becoming fixed rather on the cleverness than on the beauty, meaning, or suitability of his work.

In considering the decorative treatment of a whole building *en masse*, we can perceive that here, again, there are degrees in symmetrical treatment. In decorating large features, divisions, or bays of a building, which in their main parts are symmetrically repeated, we may either treat these with absolutely similar decoration, and depend for effect on the breadth and largeness of expression thus gained, or we may, while preserving a general correspondence of appearance, of size, and of motive in the decoration, when viewed as a whole, give a more immediate interest to each portion by a separate and varying design in the details. The former principle, we need not remark, is that of the classic school, and, much as it has been decried and condemned in some quarters, there is almost everything in its favour, where great dignity and a monumental character are sought for. How far variation of features, similar in the main, can safely be carried, will depend, again, on the degree of logical rigidity of style in the whole. Any variation of the capitals in the Doric temple (except, of course, between columns and *antæ*, which are really different features) would have been an undoubted error, the capital being so severely and rigidly designed to give exactly the expression that was wanted, and nothing more. In the more florid and less rigidly constructive Corinthian capital, on the other hand, a variation of the design, so as yet to preserve the main outline, and keep the general proportions of all the capitals symmetrical, might hardly have been out of place even in Greek architecture, though the distinction would have to be very delicately and slightly accentuated in such a style. In a less rigid style, but with a form of capital as symmetrical as the Corinthian, the early French Gothic architects in many cases effected this variety in unity very happily; and it may be seen in a somewhat ruder manner, but very delicately carried out in principle, in the early Transitional capitals of our own architecture, when the Norman scolloped capital was played with and varied by the architects previously to its final dismissal in favour of the foliated capital. The variation in the mouldings of the main arcades in some of our cathedrals might be cited as another instance of this principle of treatment, so far as effect goes; but this was in many cases the result of work being carried on at slightly different periods, by different hands, rather than of a deliberate intention. In Norman work, as at Peterborough, it appears, however, to have been done with design. But in general it may be observed that this method of varying the treatment of symmetrical parts may be more fully and safely applied to portions which are not a part of the constructive design,—more to spandrels and panels than to piers and arches; and this is the more so, of course, the more rigid and symmetrical the general style of the building. Any important variation in the archivolt mouldings of an "Italian" arcade would be likely to be felt as an impertinence. On the other hand, the unsymmetrical treatment of symmetrical parts is a principle especially applicable to small works of the nature of furniture, vases, and other such classes of articles. Of this we see admirable examples in the design of the ornament on a good many of the enamelled Japanese jars which have come so largely into the market of "taste" lately,—those in which the body of the vase is divided into circles or segments of circles, symmetrically arranged, but filled in with ornament differing both in colour and design in each compartment.

Proceeding from parts to the whole, and considering the application of symmetry to entire buildings, or to architecture in the largest sense, we find the observations which we made in regard to its value in ornament holding true to very much the same extent and in the same manner in regard to complete structures. Whatever may have been urged to the contrary, mankind have considered, and will continue to consider, symmetry of general design as an important element, one of the most important elements, in the expression of architectural grandeur and dignity. This may be carried into pedantry, no doubt, as in the case of a critic of St. Paul's referred to in a recent article, who thought it must be evident to every right-thinking person that the building was defective in not having the dome in the centre and the two ends identical in design. This good man's mistake arose from his not considering that St. Paul's was not intended to front each way, but to be entered (on great occasions) at one end, and that the progressive development of the design was from the westward towards the dome as the main internal feature. But if we take the west front of the same building, every one can readily imagine how much the dignity and stateliness of this, the main front externally, would be impaired by a variation in the western towers, so as to destroy the symmetry of the design. If the cathedral had been intended to be approached by a main avenue from the side also, and the flank had thus become as important as the front, there can be little doubt that Wren would have constructed it symmetrically, and have placed the dome centrally with the said avenue, if not with the building. It is not to the purpose to quote such an instance as the spires of Chartres in opposition; because, in the first place, Gothic is a less quiescent style and aims less at repose than Greek or Roman, and therefore what would assist the expression of the one might militate against the expression of the other; and, secondly, because the variation of the Chartres spires is a matter of accident rather than design, and its interest is at least as much historic as artistic; and there can be no doubt that any one who made a design now with that degree of variation in towers so placed (symmetrical on plan) would be held to have blundered. As a general rule, indeed, the great buildings of the Mediæval period are not nearly so much examples of a contempt for symmetry as has been pretended; the noblest of our cathedrals were designed as symmetrical buildings in their main mass, with a precise repetition of features on each side; the adjuncts of chapter-houses, cloisters, &c., which go to make a one-sided plan, and give the idea of irregularity, ought strictly speaking to be regarded as separate structures from the main design. The extent to which the cathedrals have been pulled about and added to at different periods has created in the mind of the public and of architectural amateurs an idea about their want of symmetry and regularity which is contrary to fact and to the intentions of their builders. On the other hand, it may be said with truth that in the largest proportion of buildings which have to be erected in the present day, absolute symmetry is unnecessary and unsuitable, in many cases highly untruthful; for it is contrary entirely to the genius of architecture to mask an irregular and unsymmetrical plan behind a symmetrical exterior. What has been observed in regard to ornament—that symmetry means repose and stateliness, and that irregularity or partial symmetry means movement and vivacity,—holds true to the same extent in regard to buildings. Where we require the highest form of stateliness and dignity, either in the palace, the town-hall, or the mansion, we require symmetry of design, the more so because in almost every such case symmetry of plan is a necessary element also. Where we wish for the expression of comfort, convenience, elegance, and what is called the picturesque element, we may discard symmetry; and the extent to which we do so will almost be the measure of our progress from the palatial to the domestic, and from the architectural to the picturesque.

These considerations are not without significance in relation to the great attention which has lately been bestowed upon almost the only national school of ornament of real originality and value which has in a considerable proportion of its productions ignored symmetry altogether—the Japanese. These remarkable decorators have understood, as we observed, how to employ symmetrical arrangement in their designs without symmetrical details. But in a large class of their works symmetry is entirely ignored, and the only object seems to be to put on as much as possible of beautiful workmanship, without any reference of one part to another, or of the whole design to the object to which it is applied, and which it decorates. We are exhorted sometimes to admire this "artistic freedom," and to imitate this haphazard overlaying of articles with miscellaneous ornamental detail. Now, unless the tastes and perceptions of all the rest of mankind, including the most highly-cultivated races that have ever existed, were totally wrong and mistaken, it is evident that a distinct law in the arrangement of ornament, and a distinct reference to the space and shape it is to occupy, form a great part of the art of design. To throw upon an article, be it what it may,—a vase, a flower-jar, a cabinet,—to throw upon it irregularly ornamental detail, of however elaborate and beautiful design and workmanship in itself, without order or symmetry, is simply for the designer to ignore one half of his work. The admirers of the Japanese cabinets for which such prices are given speak of what they are pleased to term the uninteresting and unintellectual repetition of parts in ornament of the Renaissance school. The fact is that the careful execution of a symmetrical ornament is one more evidence of the skill and care of the workman. The perception of this is really at the bottom of the rather affected objection to stencilling coloured ornament held by some modern Gothic architects,—it is a mechanical performance of what should be done by the care and skill of the art-workman. The sense of a difficulty carefully overcome always adds to our pleasure in the contemplation of a design; and thus, if we do not advocate the execution by hand of all painted ornament of the symmetrical type (the gain scarcely compensating for the loss of time in such a case), we contemplate with loving admiration the exact execution in marble of the Greek symmetrical ornaments, the two sides identical to a hair's breadth, as a beautiful example of delicate, and careful, and conscientious workmanship, compared with which the Japanese and Chinese irregular and unsymmetrical elaborations of ornament appear comparatively coarse and unintelligent efforts, in which that combination of intellectual interest and mechanical perfection which is necessary to produce the highest forms of artistic ornament is absent.

BLACKFRIARS GOODS WAREHOUSE.

IRON FOR STRUCTURAL USES.

THE new goods warehouse that is being built by the London, Chatham, and Dover Railway Company, and which has been in progress for more than two years, and is now very near completion, is an extraordinary structure in various respects, but most notably perhaps for the enormous quantity of wrought and cast iron that has been used, and with much skill and success in the erection.

The building is remarkable also for the quantity of property that had to be demolished in clearing the site. Upwards of thirty houses had to be taken down, and although the property was of an inferior character, the company had of course to pay full value for it; or rather more. In the case of a dilapidated tavern in Holland-street, with ten years of the lease to run, for which the occupier, it was stated, considered 5,000*l.* an insufficient *solatium*, we are not prepared to say this was wrong. Holland-street was for the greater part absorbed by the goods warehouse, and closed as a carriage-way, but a subway in its stead was provided for foot-passengers. One side of the warehouse faces Blackfriars-road, from which, however, it is but little seen, because of the numerous lines of railway that intervene. The other side elevation fronts Green-walk, now a spacious thoroughfare of about 22 yards wide, which now takes the traffic into Southwark-street and Blackfriars-road. One end of the warehouse faces what remains of Holland-street, from which are the principal entrances: the other end is towards Southwark-street, at which also there are entrances.

The site covered is an irregular parallelogram, being about 276 ft. long by 126 ft. at its greatest, and 120 ft. at its narrowest, widths. Having five floors, including a basement, it would appear that the building has an aggregate of about 18,090 square yards, or nearly 4 acres of floor-space. It is divided on the sides into eleven bays, with two windows in each, or nearly 300

windows in all, including the end elevations. The windows are all of iron. The only communication for goods between the basement and the floors above it is by hatchways and hoists. The basement, which will be appropriated to the storage of ale chiefly, is 9 ft. 8 in. high, and is paved with Staffordshire bricks. The roof of the basement is supported upon 101 longitudinal wrought-iron girders, having a total length of 10,400 ft., and 550 cross girders. Between the cross girders jack-arches, with two rings of brick, are thrown, which are covered with concrete, levelled up, and 4 in. thick at the crown. The principal floor, immediately over the basement, is supported by the girders already referred to, that are borne by 164 cast-iron columns, including 27 principals, 9 ft. 4 in. high and 2 ft. diameter, each weighing 2¼ tons. These are the main supports for the whole of the interior. They have under each column an iron bed-plate, 4 ft. square, and weighing 1¼ ton, the bed-plates being laid upon granite bases, and these again upon beds of concrete, 8 ft. 9 in. square. The remaining 137 intermediate columns in the basement are from 9 in. to 7 in. diameter. The total weight of cast and wrought iron at and under the ground-floor is 471¼ tons.

On the ground-floor, to which carts and wagons have access, the forest of columns in the basement, and in the upper floors, would be quite inadmissible, and only the twenty-seven principal columns appear, which are carried right up through the other floors to the support of the roof. These columns are 22 ft. high, 2 ft. diameter at the base, and 1 ft. 9 in. at the capital; they weigh five tons each. Intermediate columns are introduced in the upper floors, which necessitates the provision of enormous strength in the girders that have to carry them and the superstructure. The main girders, 106 in number, that support the first-floor, are probably the most remarkable collection of wrought-iron riveted girders to be met with in the world. Sixty-one of these girders weigh an average of 11 tons each, and forty-five others an average of 4 tons each; in all about 800 tons. Upon these main girders 300 cross girders rest, that are the same in construction as those on the ground-floor level, that is, 12 in. by 6 in. by 6 in., and 58 lb. per foot. These are placed at distances of 6 ft. 6 in. between centres. The total weight of iron work in this floor is about 940 tons of wrought-iron girders, and 135 tons of cast-iron columns. The largest of these girders, which are fish-bellied, have the large dimensions of 3 ft. 11¾ in. deep in the centre, and 3 ft. 3 in. deep at the ends. The ground-floor is paved with granite cubes for the wagon ways, and with wood paving in other parts. This floor has two strong planked loading stages each 235 ft. long, 10 ft. wide, and 3 ft. high.

The first and second floors are almost entirely alike in construction, as regards the iron work. They have 361 wrought-iron girders, and 340 columns, including the continuations from the basement of the 27 principals. The first floor is 10 ft. 6 in. from floor to ceiling, and is laid with 2½ in. tongued planks; the second and third floors are 10 ft. and 9 ft. 6 in. high, respectively, and are laid with 2 in. tongued planks. The joists are 12 in. by 3 in., and 11 in. by 2½ in. The upper floor has 32 cast-iron columns, that bear the lattice girders upon which the principals of the transverse roofs rest. The roof principals are placed 27 ft. apart. The tie-beams are 11 in. by 4 in.; the king-posts, struts, and other binding parts 8 in. by 4 in., purlins 8 in. by 3 in., and the rafters 6 in. by 2½ in. Strong wrought-iron forged straps are employed at all the junctions of the principals. Diagonal boarding, 1 in. thick, and Countess slates cover in the whole. There are six roof gutters across the building, each 2 ft. wide, and laid with 6 lb. lead. The gutters are 58 ft. above the ground line. Fourteen of the main columns are made available for conveying part of the roof water to drains at the base of the building, from which it is conveyed to a street sewer. There are also cast-iron rones in each bay on the Green Walk side for the same purpose.

The ground-floor is laid with a line of rails along each side of the two stages, and a single line across each end of the warehouse, and is also furnished with eight turn-tables,—two at the ends of each of the stages. The rails on the ground-floor are 28 ft. 9 in. below the level of the rails by which the Midland and Great Northern Companies will communicate with the warehouse. The loaded trucks will be lowered and raised by powerful hydraulic lifts. There will be twelve cranes on the ground-floor, capable of lifting from 25 cwt. to 2 tons each. The communication between the ground and upper floors will be by nine cranes, inside and outside. There is communication between the floors by hatchways,—four to the basement, 12 ft. by 6 ft.; six from the ground to the first floors; and two each in the second and third floors. The walls, of Staffordshire blue and white Burham bricks, are 3 ft. thick, with a foundation footing 7 ft. 6 in. broad. They are built in cement to the rail level; there are also six bands in cement, a foot deep, all round the building, at graduated heights.

The quantity of iron used in the building exceeds considerably 2,000 tons, including more than 78 tons of best wrought-iron rivets. The quantity of timber used in it amounts to about 31,000 cubic feet.

The whole work has been designed by, and executed under the direction of, Mr. Wm. Mills, C.E., engineer-in-chief to the London, Chatham, and Dover Railway Company; resident engineers, Messrs. J. A. C. Hewitt and R. Barker; contractors, Messrs. Hill, Keddell, & Waldron; contractors for the ironwork, Messrs. Mat. T. Shaw & Co., of London and Stockton-on-Tees, whose engineer, Mr. C. M. Chittick, arranged the working drawings, and supervised the manufacture of the ironwork. It is worthy of note that, notwithstanding the irregular shape of the building, one side of it being a curve, and its width at any one point being different from what it is at every other, the girders are so numerous, so varied in form and dimensions, and many of them so enormous in size, it was thought practicable to put them together at a distance, which was done with complete success; the whole of the girders having been made at the works of Messrs. Shaw & Co., and brought upon the ground ready for their places, into which they fitted readily, not only without alteration, but with absolute precision, a result of which the firm may reasonably be proud.

OVERCROWDING IN SOUTH WALES.

It appears from the proceedings of the local authorities, that the expansion of the mineral trade of South Wales, and the consequent increase of the population in the various centres of industry, are attended with a scarcity of houses for the constantly-increasing number of inhabitants. At the meeting of the Cwmdn Board of Health last week, a case was named of a house where eleven persons, including three married couples, were occupying one small sleeping-apartment! and instances were given where six, eight, and even ten persons, consisting of different families, were living, cooking, and sleeping in the same room. In the course of a discussion which took place on the subject, it was proposed that immediate steps be taken to put a stop to such overcrowding as highly injurious to health, and that the officers of the Board be instructed to take measures to prevent it, when several of the members present opposed the proposal on the ground that "the inspector had no legal right to interfere with private houses," and the matter was allowed to drop without any action whatever being taken. We should be disposed to say it is will rather than power that is wanting.

THE NEW BLOCKS AT PEABODY SQUARE, BLACKFRIARS.

The two new blocks of buildings which have for some time been in course of erection in addition to those already occupied, and known as Peabody-square, in the Blackfriars-road, are now nearly completed, and will be ready for occupation in a few weeks. These additional blocks, which have been erected by the Peabody trustees in consequence of the numerous applications for dwellings in Peabody-square, are situated on the north side of the present building, on the site formerly occupied by the Magdalen Hospital, and extend to Webber-street, Blackfriars, which forms their northern boundary. They have each a frontage of about 60 ft., but the principal elevation of only one block faces Blackfriars-road, the block immediately adjoining the present buildings running east and west, with a north frontage, the side elevation of this block, and the main frontage of the extreme north new block being a continuation of the Blackfriars frontage of the original buildings. Although the architectural elevation of the new buildings is mainly uniform with those already occupied, it is not quite of the same character, the new blocks being five stories in height, whilst the others are only four stories. On the ground floor of each block there are two dwellings containing three rooms, and two containing two rooms; whilst on the first, second, and third floors respectively, there are five dwellings, of which two have three rooms, two two rooms, and the other a single room. The fourth story contains three dwellings with three rooms each. The blocks thus contain twenty-two dwellings each, or forty-four dwellings in all. The wash-house and laundry are situated at the top of the buildings on the fourth floor, and provided with wash-tubs, wringing-machines, and other requisites, in addition to two large drying-rooms. There is also a dust-shaft on the same floor, carried down to the bottom of the building, to which there is access at the several stories. An improvement has been made in some portions of the fittings, the cupboards, amongst other things, being larger and more convenient than those in the adjoining blocks. At the rear of the blocks there is a recreation-ground, although rather limited in space. We understand that the number of applicants for the new dwellings exceeds their number, and that they are already let.

The architect is Mr. H. A. Darbishire, who designed the original block, and Messrs. W. Cubitt & Sons are the builders.*

IMPROVED STREET CONVEYANCES.

With the introduction of "Hansom's Patent Safety" cabs, or as they are called for the sake of brevity, "Hansoms," a marked improvement took place in the means of conveyance in the streets. Every other cab plying in the streets of London is now a Hansom, and the large provincial towns have adopted the improvement. When the underground railway was opened, people prophesied that a marked decrease would be apparent in the number of public vehicles in the streets; but experience has shown that the number of cabs and omnibuses has increased instead of diminished. When, two or three years ago, tramways, on improved principles, were revived among us, it was said that the use of omnibuses, at any rate, would become less common; but still they seem to increase in number, and, instead of decreasing, cabs and omnibuses are becoming more and more numerous. With all this demand, hardly any improvement has taken place in the comfort of the public vehicles: "four-wheelers," or as they are irreverently called, "growlers," are not a whit better looking or better fitted than the first "hackney carriage" of an age gone by.

The Society of Arts has at last come to the rescue of the grumbling, but patiently suffering, British public, by offering prizes for the best cabs that have actually plied for hire in the streets of London for six months before the date of the competition. About eight or ten different vehicles, — four-wheelers and two-wheelers,—accepted the challenge; and after complying with the necessary conditions, were subjected to examination and comparison, and exhibited among the other carriages in the International Exhibition, which closed on the 31st ult. These cabs have thus undergone not only examination by the Society of Arts Committee, but by the public in general; and the verdict is in most cases the same. Those who have not been enabled to see the "pattern" reformed cabs at South Kensington will have an opportunity of doing so at the Crystal Palace, whither they are, we believe, to be transferred.

The prize cab, that which by public consent is declared the best, and which has received the medal of the Society of Arts, is an improved Hansom,—a two-wheeler. Its chief feature is its roominess: carried on wheels of the same width as the ordinary Hansom, its inside measurement is 4 ft.,—7 in. or 9 in. wider than the average cab. Two doors in front, opening simultaneously from the centre, and reaching to the roof, take the place of the awkward folding windows and doors of the ordinary Hansom. The upper part of the doors is fitted with windows, which can be opened or shut at pleasure; these doors can also be shut or opened by the driver on the seat behind, by connecting-rods at the top of the cab; at each side of the cab are sliding windows. The shafts are hung on a spring, giving greater easiness in riding; and the cab is decidedly most comfortable in every

* A view and plans of the original buildings will be found in our volume for 1872, pp. 26, 28, 29.

respect. It weighs 8 cwt., costs 75*l.* to 90*l.*, and is built by C. Thorn, of Norwich.

Next to this comes a four-wheeler, by Lambert, of Great Queen-street, which has received a prize of 30*l.* It is a most roomy cab, more like a private Brougham than a cab in appearance. The back part of the roof can be folded back by any one inside,—a lady might close or open it,—thus affording an open carriage for the summer. Beneath the lining at the back of the front seat is a roomy "boot," and at the back of the cab a convenient box for "nose-bag," &c. The price is 85*l.*

A four-wheeled cab to carry four inside (by Quick & Norminton, of Kilburn) presents some novel features; but it appears too complicated, and lacks solidity enough for street traffic. The front part of the cab is fitted with windows, and, by raising the box-seat, can be doubled back so as to form a carriage open in front, with a hood behind, for summer use. Beneath the box-seat is an open space available for parcels, &c. Behind is a ventilator, and it is proposed to add a clock to prevent disputes as to hire by time. The windows are provided with small discs of india-rubber,—a very slight, but very noticeable, feature in the comfort of the vehicle. A company has been formed for the purpose of supplying these cabs to drivers at the rate of 16*s.* per week. The price is 90*l.*, and the carriage weighs about 9 cwt.

A novel feature in several cabs, both four-wheelers and two-wheelers, is the position of the doors, which are placed neither at the side, as in a Brougham, nor exactly in front, as in a Hansom, but at the fore corner, diagonally. A Hansom (two-wheeler), by Marston, of Birmingham, has a semicircular front, with a door on each side, hung on a door-post in the centre of the foot-board, and opening towards the horse. Another, by the same firm, has the doors opening outwards; and a four-wheeler to carry three inside has a similar arrangement. Messrs. Mansfield & Crosse, of Exeter, exhibit a four-wheeler, to carry two, with doors similarly hung. The advantages of these doors are apparent at once. There is no awkward entrance through which one has to take one's seat in the cab backwards, and no folding window against which to crush one's hat, as the doors reach from the floor to the roof, and are fitted with drop-windows. Messrs. Marston also contribute a Hansom which dispenses with doors, but has instead a large stiff apron, which lifts upwards against the splash-board, and when closed forms a complete covering to the legs: it has the disadvantage, however, of the old-fashioned dropping window. A very awkward innovation divides a similar apron into two parts, necessitating two movements to open it; provides a small door reaching half-way up to the roof, which opens outwards, diagonally, falling open of its own accord if not actually fastened; and retains the old windows doubling back against the roof. Such a complication of movements would deter any one from entering the vehicle.

Messrs. Turston, of Leeds, exhibit a curious adaptation of the Hansom, with two doors reaching to the roof, one on each side, opening diagonally on a common centre; the seats are four in number, two in the ordinary position, and one on each side of the cab, the body of which is necessarily much longer than that of the existing cabs in general use.

Such are some of the more noticeable features in cab building which the prize of the Society of Arts has brought forth. It is to be hoped that two or three of the types will be brought into actual use in our streets. A man with a cab like that of Messrs. Thorn, of Norwich, Messrs. Marston, Messrs. Quick & Norminton, or Messrs. Lambert, would hardly ever be without a "fare." In fact, when these cabs were serving their term of probation, it is said that they were continually engaged.

The Proposed Building Act.—At the meeting of the Metropolitan Board of Works to be held this, Friday, November 7th, a report of the Parliamentary Committee will be considered:—

"Submitting, for the approval of the Board, the draft of the Metropolitan Buildings and Management Bill; and recommending that the Board do consider the same, and decide as to its introduction into Parliament in the next Session."

And the following notice of motion by Mr. Roche:—

"That the Board approve of the principles of the Bill, and that the same be referred to the Works and General Purposes Committee to report whether any of the clauses require alteration or amendment."

RECENT EXCAVATIONS IN ROME.

On this subject Mr. J. H. Parker delivered a lecture last week in the Ashmolean Museum, Oxford. Mr. Parker said much credit is due to the Italian Government for the vigorous manner in which they are carrying on excavations in the Forum Romanum, and on the Palatine Hill, and in the Thermæ of Caracalla, as well as at Ostia and at Tivoli; in fact, all those antiquities which are acknowledged to belong to the Government. The Italian Parliament votes 1,200*l.* a year for this purpose, which is understood to be chiefly for the excavations of the Palatine Hill, with the slopes round it, including the Forum Romanum. They have now connected the excavations made in the time of Napoleon III., and each fresh excavation proves more clearly the substantial truth of the ancient legendary history of Rome. These it is intended ultimately to make into a second Pompeii in the middle of Rome, including the most interesting archæological ground in the world, but many years must elapse before this admirable project can be fully carried out. In the meantime, since Rome has been made the capital of Italy, a new city is being built within the old walls, but practically on what is now a new site, in the city of the empire, upon the hills on the eastern side of Rome, which had been deserted for centuries; the modern Rome of the popes of the sixteenth century having been built on the level ground between the hills and the Tiber; but the great flood decided the builders not to build on that site, and to begin the new city on the high ground. This new city is making extraordinary and rapid progress; upwards of 2,000 houses are building in Rome at this moment. New streets, new quarters of the city are being built, new drains being made on the most magnificent scale, and at an enormous depth, vieing with those of the old Romans. But in doing all this the remains of the ancient city of the time of the empire are being brought to light week after week, and often buried again the next. The municipality of Rome does its utmost, by appointing an Archæological Commission, with a very active secretary (Signor Lanciani), to preserve the records of all that is found in the shape of notes, plans, drawings, and photographs, and they publish a monthly archæological journal to record what is found, and whatever works of art are found, if portable, rescued and carried to their museum on the Capitol. Further than this they cannot go. If anything is to be preserved in its place it must be purchased by some one, and presented to them, when it would not be refused; they would gladly take charge of it, and guarantee its preservation by the proper officials. This has frequently been done in France by the French Archæological Society, who purchased antiquities, and had them officially registered as public property. In Rome it has happened unfortunately that from the ignorance of the architects and engineers employed by the Government a number of very interesting historical monuments must now be destroyed, which might just as well have been preserved without loss to any one if only the Government had possessed proper information. The first mistake was in giving a part of the thermæ of Diocletian, and the great reservoir of water that supplied those thermæ, as a site for the railway station, and therefore cutting through the great agger of Servius Tullius obliquely in order to arrive at it. The station might just as well have been placed outside of the agger in the space, half a mile wide, between that and the outer wall. The consequence of this has been that the railway station being naturally made the centre of the new city, all the rest of the agger is rapidly being destroyed. The Government engineer fixed upon the northern end of it as the site for the new Government offices (the Somerset House of modern Italy); consequently he was obliged to make a temporary railroad for the purpose of carrying away the thousands of loads of earth which had been piled up more than 2,000 years ago, and which might just as well have been let alone. It was an enormous waste of public money, which would have been disgraceful to all concerned had it been wilful; but it arose from mere ignorance, and nothing else. The most recent discovery is the foundation of the round temple of Vesta, at the corner of the Palatine Hill, and just to the south of the Forum Romanum, in front of the Church of St. Maria Liberatrice, in the garden of which inscriptions have been found of vestal virgins buried there. It had previously been ascertained that the celebrated three columns near this point belonged to the temple of Castor and Pollux, which also served as a vestibule to the palace of Caligula, which was therefore on the low ground at the foot of the hill, close to it. The remains of the temple of Julius Cæsar have also been found between this and the temple of Antoninus and Faustina, with a fountain at the south end of the Forum, the whole length of which has now been excavated on the western side, with the platform of the great Basilica Julia, called also Curia Julia, on which Signor Rosa has built a number of brick bases.

CHEAP SUBSTITUTE FOR DOUBLE WINDOWS.

Dr. Oidtmann, of Linnich, in a pamphlet on Sanitary Measures, suggests that "double-grooved window-glazing" should be used, instead of double windows, by which, as he says, great expense may be saved. This is done in the following manner:—Two grooves are channelled in the frame for receiving the panes, an outer and an inner one, and in both of them panes are then put in and puttied. A space of about 3-16ths to 3-8ths inch is thus formed, containing a dry atmosphere, cut off from the air both in the room and in the open air. As it cannot perceptibly contract or expand, the outer panes repel the cold of the outer air, the inner the warmth of the room. For such a double-grooved window-glazing good hard glass (poor in potash) must be selected, so that, especially in southern aspects, the rays of the sun do not decompose and render dull the facing sides of the panes, which naturally cannot be cleaned. In putting the panes in, therefore, care must be taken, not only that the facing sides are scrupulously cleaned of all dust and dirt, but also that the air between the panes be dry. The glazing of the window should therefore take place only in dry weather. It is self-evident that ice-flowers never appear on such windows. Their increased cost will be covered the first year by saving in fuel. The new method acts also as a protector in summer against the troublesome heat of the direct rays of the sun. A room provided with double-glazed windows, at a temperature of about 26° R., will be 4° R. cooler than one with ordinary windows. The method may also be applied to hotbeds, for which it has proved efficient, and for large areas of glass and greenhouses double glazing might be likewise very advantageously used.

THE ARCHBISHOP OF YORK ON ART.

The annual meeting in connexion with the Selby School of Art was held on Wednesday in last week, when the Government and local prizes were presented to the successful students by the Archbishop of York. On the walls hung the drawings and paintings of the pupils during the year, as well as upwards of 100 works of art, lent by the director of the South Kensington Museum. Amongst those supporting his grace on the platform were Colonel Graham (one of her Majesty's inspectors of science and art schools), Rev. Canon Harper, Rev. G. Wyndham Kennion (diocesan inspector of schools), Rev. J. B. Mitchell, Mr. J. T. Atkinson (sec.), and others.

The secretary read the report, and the Archbishop in the course of his address said:—Art is of all things the most democratic. It cannot be produced without a certain gift, which seems to be imparted equally both to the highest, to the middle, and to the lowest class; and here every one may meet upon a common ground, and he who has to deplore,—if it be a thing to be deplored—that he is one of the humblest class, may yet see his name stand high with those of the foremost artists in the world, for they, too, have sprung from but humble origin, and, using well the talents God has given them, rose to be the admired of mankind, and the benefactors of their race. That applies to every art—to architecture, to music, to painting, to sculpture,—to everything that is called art. It is a fair field, and the course is open to all, and those who start under some disadvantage of education find in this more than any other career how easy it is for pains and trouble to compensate those differences, and place them in the front rank, although they started in the last. Let us ask ourselves what art is. And that is rather a difficult question. A Frenchman said that art was that which taught you to do easily something

well which by nature you could do naturally but very ill. I think you will find that remark, although it is not a definition, goes a long way towards the truth. Art is the production of things in beautiful form of every kind. There is an art in writing the article that you read every day in the newspaper,—that easy style of writing which is now attained by so many, and which once was the privilege of only a few,—is, in fact, attained by great practice and great painstaking, and that nice taste and feeling which prevents error in all development of thought. Art, then, is the power of doing something which naturally we could do, but which we cannot do properly or easily without the help of rule and of practice, and of a certain innate gift which it would be extremely difficult to define.

THE PHOTOGRAPHIC EXHIBITION.

The present exhibition, made by the Photographic Society, in the Rooms of the Water-Colour Society, Pall-mall East, has a special feature of its own, and should be visited by all who are interested in the art. Mr. Crawshay, himself a distinguished photographer, offered prizes for life-size portraits, open to the whole world. The following gentlemen were the adjudicators:—Mr. J. Glaisher, F.R.S.; Mr. G. D. Leslie, A.R.A.; Dr. Diamond, F.S.A.; Mr. W. Mayland; Mr. H. Baden Pritchard, F.C.S.; and Mr. G. Wharton Simpson, M.A.; and the result is as follows:—

First prize for large heads (50*l.*), Messrs. Robinson & Cherrill.

Second prize for large heads (25*l.*), Colonel Stuart Wortley.

First prize for small heads (25*l*), Mr. Valentine Blanchard.

Second prize for small heads (12*l.*), Messrs. Robinson & Cherrill.

Prize for Enlargements (25*l.*), Mr. B. J. Edwards.

The exhibition includes the portraits submitted in competition, some of which are remarkable works, and must be regarded as exhibiting the greatest advance in the art of photography made for some time past. Several foreign practitioners of high reputation are amongst the exhibitors.

THE FALL OF CHIMNEY AT NORTHFLEET.

Sir,—The important questions asked by your correspondents of last week deserve the completest answers that can be given to them, and these, with your kind permission, I will try to put in as concise a form as possible. I will take the various points in the order in which they stand, beginning with those in the letter signed "B."

1. The first question raised is, whether, considering the diameter of the chimney at top (8 ft. 9 in. inside), the 14-in. work (36 ft. 3 in. deep) did not extend too far down. I do not understand your correspondent to suggest that there was the least approach to anything like a crushing weight on the lower part of this work, and a simple calculation (taking the common estimate of 15 tons to the rod) will show that while the pressure on the base of the 3 ft. 9 in. work (which has never shown the slightest crack or flaw) was 6¼ tons to the foot super., the pressure on the base of the 14-in. work was barely 2¼ tons to the foot super. In other words, the thin part of the shaft was three times as strong as the thick part, in proportion to the weight it had to carry. The inquiry seems, however, to be directed to the power which this 14-in. work might have of resisting an oblique pressure (such as might for instance, be caused by slightly uneven bedding) tending to make it bulge or crumple outwards; and the suggestion is whether 36 ft. is not a rather extreme height for a 14-in. circular wall of as much as 9 ft. internal diameter. I have now before me the working drawings of a chimney at Wokington, belonging to the West Cumberland Iron and Steel Company. This chimney is 200 ft. high above the ground, 12 ft. 10 in. internal diameter at the top, and is only 14 in. thick for 67 ft. down. I am informed by a builder at Manchester, who has erected a great number of lofty shafts, that they are generally finished with 9-in. work, and that this thickness is continued for 30 ft., 40 ft., and even 50 ft. down. More remarkable than these, however, because wider than most of them, is the shaft at Messrs. Pontifex's chemical works, in the Isle of Dogs. It is 228 ft. high above ground, 8 ft. in internal diameter at top, and only 7 in. thick in the brickwork for a depth of more than 40 ft. Other examples could be given, but these will perhaps be enough to show that we must look beyond this item for the causes of the failure.

2. The bond was that known as "half-brick bond," which is specially intended to prevent vertical fracture across the wall. Chimney builders say that this sort of fracture is the one that almost always happens in the failure of a shaft, and that a split of the opposite kind, down the middle of the wall in the direction of its length, is hardly ever heard of. To prevent transverse fracture, the more stretchers can be used the better; and in a straight wall, the "half-brick bond" contains at least twice as many as would occur in old English bond. In circular work, no stretchers appear on the outside, but the principle is carried out in the remainder of the thickness. The brickwork at Northfleet was bonded throughout on this system, with the greatest care, and probably this part of the work could not have been much improved unless by using facing-bricks made purposely to the curve of the chimney.

3. The whole of the upper part of the chimney was built of the best paviors, and even these were picked, every imperfect brick being rejected. The lower part of the walls was partly composed of the hardest stocks that could be got, and partly of paviors; but within 50 ft. of the ground there was a small proportion—perhaps 5 per cent.—of rather over-burnt and somewhat vitrified bricks, approaching in character to "rough stocks." There was no difference between the facing and backing; the same quality of bricks was carried right through the wall.

4. There was no artificial bond besides that described at the inquests. At intervals of about 3 ft., two courses of brickwork successively were built with the vertical joints dry, and then grouted with neat Portland cement. The cement which was thus poured in as grout set admirably; after falling 200 ft. these bricks were still found joined in double courses, and they had as often broken through their own substance as through the cement. There was not the least sign of expansion; but the best proof that there was none, is the fact that a large mill floor on the works was laid at the same time with the same lot of cement, and that to this day there is not a flaw or a blister in it. Your correspondent speaks of the "desirable homogeneity of the work being destroyed" by bond courses grouted with cement; but, provided that the cement sets perfectly, and without expansion, as it certainly did in this case, it is difficult to conceive how they can be anything but a source of strength to the walling.

5. The thick and thin parts of the shaft both went up at about the same number of feet per week, excepting, perhaps, the lowest section of the walling, which was done a little more slowly. Of course, more bricklayers could work where the diameter of the shaft was wider, and more materials could be drawn up by the windlass in a day when there was not so far to draw them.

6. The cap was formed entirely of brick in cement, and the cement here, as elsewhere, was the very best of the Burham Cement Company's make. The original intention was to mix it with an equal measure of sand; but, by the advice of persons experienced in this class of building, it was actually used with a small quantity of mortar instead. The idea was, that though the ultimate strength of the cement and sand might be as great, yet the cement and mortar would adhere to the bricks better at the beginning. Whatever may have been the cause, it appeared after the accident that a considerable part of this cement-mortar had not set with anything like the firmness of the neat cement grouting; and though it is hard to see how, on a quite calm day, this imperfect setting could have caused the fall, it is evident that it may have helped to make it possible. A tentative opinion was expressed at the inquest that the vibration from the derrick might have had something to do with this imperfect setting; but this theory did not seem to be confirmed in the course of the inquiry. It is only certain that while the cement which was used as grouting set like iron, the same cement used as mortar set in many places but very indifferently. There are two considerations which naturally suggest themselves here: one is, that if bricks are not sufficiently wetted (and most bricklayers show an invincible repugnance to wetting them sufficiently) the more liquid the cement the better; the other is, that cement grout, once set, cannot be worked up again and used, whereas cement-mortar can be, and I fear too often is. I make these remarks without intending the smallest personal blame to the contractor, Mr. Blagburn, who showed himself an excellent and very careful workman; but a great part of his time was necessarily passed at the foot of the shaft, in superintending the mixing of the mortar and the selection of materials.

Proceeding to the shape of the cap, I may say that it was formed of equal oversailing courses of brick, each course projecting about three-eighths of an inch beyond that below. The extreme projection attained by the body of the cap was 15½ in. beyond the point from which it started; but as it took nearly 10 ft. of height to do this, and as the shaft diminished upwards at the rate of 6 in. in 10 ft., the projection of the top of the cap from the receding line of the shaft was 18½ in. Upon the body of the cap there were eight flat projections or piers, each 1 ft. 11 in. wide, carried up in oversailing courses, ranging precisely with those of the body. The projection of these piers, from top to bottom, was 4½ in. beyond the main part of the cap; and the bottoms of them were supported on a series of courses oversailing still more gradually than the upper ones. Above the cap, the shaft wall was continued up above for a height of 4 ft. 6 in.; and the result of the whole was, that at the time of the accident the sectional area of the projecting cap was 7 ft. 4½ in. super., while the sectional area of that part of the shaft which counterbalanced it was 20 ft. 10 in. When it is remembered that this section had the immense additional security of being worked on a circular plan, it seems very evident that the cap had no tendency to fall outwards by its own weight; and, on the other hand, its pressure on the 14-in. wall below it was considerably less than half a ton to the foot super. It ought to be known that the two bricklayers who came forward at the inquest to express an opinion that the cap had "swagged" the shaft over, had never seen either the cap or the drawings of it. Your correspondent will observe, from the above description, that the cap was not "placed on the shaft only the day before the accident," but was merely finished on that day, having been built up like the rest of the brickwork.

7. As to the outline of the fracture, the highest part was on the south-west side, and it sloped down irregularly for perhaps 30 ft. in the opposite direction. For about 100 ft. at the bottom the shaft was upright and sound, except where small cracks occurred, in the upper part of this length, from a cause to be presently described. The top of the ruin overhung considerably towards the north-east, and there were vertical fissures extending for a short distance down. The smaller fissures, and very likely some of the larger ones, were produced as follows:—The cross timbers on which, one after another, the internal scaffolds had rested, were left in till the completion: at the moment of the accident, great masses of brickwork fell on these timbers, and thus violently jarred the walls at the points where they were inserted, and the result was that many of these points were subsequently traceable on the outside by bulges and radiating cracks.

We do not know, and probably never shall know, what caused the instantaneous collapse. It may have been started by some slipping of the derrick on which the men at the windlass below were hauling; it may have been begun by the falling inwards of a part of the chimney wall above the cap. The first warning of the accident was the descent of bricks down the interior of the shaft, and this preceded the general fall. The only witness who has deposed that he saw the actual collapse from the outside states that it began, so far as he saw, by the bulging of a point on the north-east side of the shaft, some 10 ft. below the cap. If we suppose a mass of brickwork from the top chimney wall, built that very morning, to have been pushed over by any cause, and to have struck the cross battens at this level, we have a not impossible way of accounting for the disaster.

James Cubitt,
Architect to Messrs. J. C. Gostling & Co.

The Institution of Surveyors.—The President and Council have issued invitations for a *conversazione* on Wednesday evening, the 12th instant.

A MEMORIAL REREDOS OF THE LATE BISHOP OF WINCHESTER.

The late Bishop of Winchester laid the foundation-stone of the Church of St. John the Divine, in Vassall-road, Kennington, which is intended to be one of the largest churches in the metropolis. The chancel, externally, was completed about two months ago, and it was originally intended not to open this portion of the edifice, along with a temporary nave, until the estimated cost for the permanent church was subscribed; but in consequence of an anonymous donation of 10,000*l.* towards the building fund having been received, the erection of the nave and the other portions of the permanent building has just been commenced, and the foundations are now being got in. It has, however, been determined not to wait for the completion of the whole building before the opening takes place. A portion of the nave will, in the first instance, be completed, and, as at present arranged, the opening ceremony has been fixed for the month of May next. In the meantime, the completion of the interior of the chancel, the lady chapel, the sacristy, organ-chamber, and other portions of the edifice already built, will be proceeded with simultaneously with the erection of the nave, and the internal decorations include a reredos, which has been designed by Mr. Street, the architect of the church, as a memorial of the late Bishop of Winchester. The central panel will contain a large crucifix, whilst beneath will be a figure representing Dr. Wilberforce kneeling in prayer! The estimated cost of the reredos is 500*l.*

DIAGRAMS OF BUILDINGS FOR INTERNATIONAL EXHIBITION.

The following rules have been issued by her Majesty's Commissioners for the preparation of diagrams of ancient and modern buildings of all countries in Division II., Class 9 (civil engineering), architectural and building contrivances, of the Exhibition of 1874:—1. The diagrams should be of a bold scenic character. 2. They should be executed on canvas, and may be in oil colour or distemper. 3. They may be executed in colours or in monochrome. 4. They should be perspective views. 5. Each diagram should be at least 5 ft. by 10 ft., but single diagrams ought not to occupy more than 10 ft. in height and 20 ft. in length. 6. Each diagram should be attached to a roller, and sent rolled. 7. The scale should be clearly marked upon each diagram. 8. Her Majesty's Commissioners would be glad to have the right of purchasing the diagrams, if for sale, at the prices attached to them. We are not quite sure that competent persons will find sufficient inducement for the preparation of such diagrams as are desired.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The first ordinary general meeting of the session of the Royal Institute of British Architects was held last Monday evening, at the House in Conduit-street; Mr. Horace Jones in the chair. The following gentlemen were duly elected as Fellows:—Mr. Henry P. Legg, 32, Bedford-row, and Mr. John Lowe, of Manchester.

Several donations of books, pamphlets, drawings, paintings, &c., were announced to have been presented to the Institute, as well as a bust of Inigo Jones, modelled in Italy, the gift of Mr. James Noble. Among the many donors to the library fund are, Mr. John Gibson, vice-president, 25*l.*, and Mr. G. T. Redmayne, associate, 3 guineas. Thanks having been voted to the donors,

The chairman proceeded to award the Ashpitel Prize of 1873, won by Mr. H. Stannus, for having distinguished himself the most in the architectural examination; and, in presenting it, stated that this was the first time such a prize had been awarded,—the gift of their lamented friend, Mr. Ashpitel.

In the absence of Sir Gilbert Scott, in Italy, owing to ill-health, the secretary, Mr. Eastlake, then read the presidential address, which we print *in extenso*.

The chairman said that they probably felt that, in the absence of the worthy president there were fewer opportunities for discussion than if he had been present; still, they would be glad to hear friendly criticism.

The Marquis of Westminster, who was warmly received, said that it would be highly presumptuous of him, an amateur, to take objection to anything the President had said bearing upon architecture, upon which he (the Marquis) had no claim whatever; but there were one or two points in Sir Gilbert Scott's address which particularly struck him. One of these was the excellent, powerful, and very round abuse which he had given to the dreadful specimens of architecture which covered our country and the towns of England. It seemed to him that until the public had some knowledge of architecture, and their tastes were somewhat cultivated, such discreditable specimens of architecture would very long disgrace the country; and especially so in the case of those who in after-life would probably have the means of erecting buildings. It was very unfortunate, he thought, that in high-class society very little knowledge of architecture existed. He did not know whether the Institute would have any power, but they would certainly have influence, in recommending some course of study, to suggest whether some small or better knowledge of the principles of architecture could not form a part of education in public schools. With regard to these public schools, he did not know whether it was a practical suggestion; but it seemed to him that it might be of some use to this powerful association if it used its influence in that direction. He was talking, he went on to say, a short time back to a friend of his, who had now arrived at the age of seventy-four, regarding an abbey at St. Alban's, and in reply to a question of his connected with its architecture, his friend told him that the greater part of the architecture was Roman, and that some of it must have been Norman, for it had a good deal of "dog-tooth" ornament about it. If such ignorance prevailed in old age, the time had come for giving opportunities in early life in public schools to attain to some knowledge of the art of architecture. He had but one other point to mention, and that was to take the opportunity, which he said he ought to have done long ago, of thanking the Institute for having done him the honour of electing him an honorary Fellow.

Mr. B. Ferrey, in proposing a vote of thanks to the president for his address (which was seconded by the Marquis, and carried unanimously), said he felt that the matter Sir Gilbert Scott had brought before the meeting was of so large and vast a character that it would ill become him to enter into any detail regarding it. We all deeply regret his absence, and are greatly indebted to him for his address, considering the state of his health, and the great calls upon him in his professional capacity. We must give him credit for devoting so much time to the many points embodied in his address, and we must also thank the noble Marquis for the able way in which he has expressed himself on the points he brought forward.

Mr. Ewan Christian said that with regard to the subject of the Benevolent Fund, mentioned at the annual dinner, and in which the President, he was glad to say, took such an interest, he would mention a case in illustration that had lately come under his notice. An architect of real capacity,—a man who would no doubt, had he but lived, have achieved a reputation in his profession, died, leaving a wife and family without any means of support; he had not lived long enough to make his practice profitable, or to reap the fruits of his early labours, and consequently his family was left to the charity of strangers. It was a reproach, he thought, to architects that their Benevolent Society could only in this case allow out of its funds the small sum of 60*l.* The Artists' Benevolent Society were taking care of three of the children; and for the Architects' society to allow this was a great reproach upon us as architects. Our society ought to be better supported, and more generous subscriptions should be given than those miserable subscriptions and few donations which it now received.

Mr. Jennings was of opinion that the Artists' Benevolent Society and Architects' Benevolent Society ought to be one body, as many people thought they were, and said that it was a great disadvantage that the two Associations were not more thoroughly connected.

The meeting then adjourned. Among the papers to be read during the session are the following:—

"On the Central Iron Dome of the Vienna Exhibition Building," Mr. J. Scott Russell; "On the Sanitary Aspects of House Construction," Captain Douglas Galton; "On the Old Hall and Assize Court at Winchester," Mr. Thomas Henry Wyatt; and "On Chinese and Japanese Architecture," Mr. W. Simpson.

ARCHITECTS AND ARCHITECTURE.

THE ADDRESS OF THE PRESIDENT AT THE INSTITUTE OF ARCHITECTS.

It is with unfeigned regret that I have to ask your kind forbearance with me, in my failure to appear in my place, as your president, at the opening of the first session after you have done me the great honour of electing me to that office. I had previously to that event had some idea of spending a part of this autumn and winter at Rome; and had mentioned it to my predecessor when he announced to me the kind wishes of the council. I had, however, wholly relinquished this idea, and was preparing to return from a Continental tour, when I was so urgently pressed by friends, whose opinion I had every reason to respect, to prolong my absence with a view to confirming the good effects upon my health, of the rest and relaxation in which I was indulging, that I felt I should be doing wrong to resist their remonstrances; and I have now to throw myself upon your kind indulgence, and to beg you to allow my inaugural address to be read *for me*, instead of being delivered, as it ought to be, by myself.

My regret at this is increased, and my apologies rendered the more needful, by the fact of my absence rendering it impossible for me to deal with some subjects I am bound to allude to with that care and fulness of information which I should have aimed at had I been present. These subjects, unfortunately, are amongst the most important topics for the year; as, for instance, the transactions of the Institute during the past session; the papers read at its meetings; the public occurrences relating to our profession; the more important works undertaken or completed; the Great International Exhibition at Vienna, as viewed in its bearings upon our art; and the melancholy duty of chronicling the annual obituary of members of our Institute, and of giving a sketch of the career of the deceased. On all these points my notices must be more or less defective.

On the last-named point I will venture on asking the aid of members of the Institute best acquainted with those whom we have lost, as there would be an appearance of partiality and inequality were I to attempt to record the merits of those I happen to have best known, to the neglect of those I chanced to be less acquainted with. Nor would it be proper to attempt a notice of the professional lives of those whose position was so prominent as clearly to demand a special memoir, as is clearly the case with our lamented Past President Sir William Tite, whose merits have already been frequently brought before the notice of our meetings, with that respectful warmth of feeling which delights to celebrate even facts the best known and acknowledged; and they will, I feel convinced, be shortly laid before us in a more formal manner, and one more proportioned to their public importance. I leave, then, this melancholy though grateful task, to such hands as may be selected as best fitted to its importance.

Our obituary for the year is, unhappily, a very long one. It is as follows:—Sir William Tite, M.P., Past President, Mr. R. R. Banks, Mr. R. P. Browne, Mr. W. Slater, Mr. A. S. Newman, Mr. J. H. Stevens, Mr. S. S. Teulon, Mr. C. Buckeridge, Mr. H. Williams, Mr. G. T. Randall, Mr. E. A. Spurr, Mr. W. Corbett, Mr. J. D. Simon. To these I must add our respected honorary member, Mr. G. L. Taylor; and our honorary corresponding members, M. De Caumart, Professor Hessemer, and Il. Cav. Nicolo Matas.

Those best known to me in the sad catalogue were Mr. Teulon, Mr. Slater, and Mr. Buckeridge; the first so well known as a zealous and successful follower of the Gothic revival, and the builder of numerous churches, &c.; the second as the successor of the lamented Mr. Carpenter. He having been cut off in the midst of his days, left his extensive practice, and the professional training of his young son to the care of his faithful pupil and assistant, Mr. Slater, who *right loyally* performed the task thus bequeathed him; keeping up the practice, largely as I believe, for the benefit of his friend's family, and carrying on the professional education of the son, till he was of an age to unite with him in partnership; and only living long enough to see him fairly and successfully launched as the successor—through this faithful and efficient medium—of his talented and lamented father. Mr. Buckeridge was a pupil of my own, and was carrying on his practice with great devotion, talent, and success, when cut off at an early age by a sudden illness.

I hope that further notices of these and other members of our Institute will be laid before you by those who have facts better within reach than is at this moment (unfortunately) the case with myself.

The International Exhibition at Vienna, in its bearings upon architectural art, is another subject on which I must beg the kind aid of such as have given the most attention to it; circumstances having wholly deprived me of the opportunity of making myself acquainted with it, as I feel I ought to have done.

Of public transactions bearing upon our profession I may say much the same.

I much more regret that I am not able, as I had hoped, on the present occasion to notice the works of architecture now about to be commenced, or those recently finished. I had promised myself much pleasure in the performance of this part of my duties; but this necessitated absence during the summer has rendered it impossible, and I must beg to reserve it to a future occasion, should such offer. It would to me be a most grateful task, both to visit the many admirable buildings which have recently been completed, or are in the course of erection, in a more careful and systematic manner than one would perhaps venture upon under other circumstances, and to record the just praises of their architects; and it would on the present occasion have been the more gratifying, because, in the remarks I shall have to offer, I shall feel it my duty to call attention, not indeed to the demerits of any specific works, for that would be an offensive and a presumptuous act (indeed, I rarely inquire the name of the architect of any work I should be disposed to censure), but to the general fact of the immense gulf which intervenes in our day between different works one passes, and to ask your special attention to this as one of the most serious questions of the day. Having, then, a painful duty to perform of this nature, it would have been a relief to have enumerated, and lovingly dwelt upon, some of the most admirable works of our period,—works which would have done credit to any age in either of the great branches of our art, and works which tend to establish one most encouraging fact beyond the reach of question, that if we live at a day when much is done which tends to discourage, we also have the happiness to live at a day when works of the most contrary class are produced, —works of noblest aim, of the deepest and most loving study and care, and of the highest artistic character.

I must, however, of necessity relinquish or postpone this delightful task.

Of public buildings about to be undertaken I will mention one only. I will content myself with congratulating the Institute that the great work of their talented member Mr. Street is, after so long delay, about to be commenced. I regret to observe the statement in the public papers to the effect that a considerable amount is to be struck off from its embellishments. I have not seen the drawings beyond such as have been laid before the public; but from them I should have judged that the architect had already exercised great reserve in this respect; and I fear that a further pruning down, such as is suggested by the sum named, will of necessity have a very serious effect upon the design; and I earnestly, though respectfully, urge upon the attention of the Government the importance of reconsidering this instruction; inasmuch as an amount which sounds like a small percentage upon the entire cost of a building, must bear a very serious proportion to the cost of its mere embellishments, and may go so far as to reduce them to the very verge of poverty.

This is a building of which too much has been said, which has been far too prominently before the public, not only of this country but of the whole civilised world, to permit of its perfection being tampered with to save some paltry percentage. Such a result would be a disgrace to our age and country, which have a right to demand from those in power that the architect intrusted with such an edifice shall not have his hands thus cruelly bound, but shall be allowed to embark upon this great national,—this great European,—work with a fair and reasonable amount of liberty, to render it worthy of its origin and destination; while the fierce attacks to which it has been subjected would call forth, even from their originators, if actuated by a true English love of fair play, the demand that the architect should not be unduly restrained, but should have every reasonable opportunity and facility allowed him for the production of a truly noble work, worthy at once of his own fame and of the age and country which the building will represent.

I will now proceed to the affairs of our Institute.

The annual report, which has been for some months in your hands, together with the brief conspectus of the proceedings at the ordinary and at other general meetings, will give a correct idea of what has been done during the last session, as well as of the general prosperity of the Institute.

From the former document it will be seen that our pecuniary status is well kept up; that our list of members shows a constant increase; that the Institute has been actively engaged on a number of important questions, bearing both upon our professional dignity and upon the interests of our art; that in the consideration of these questions we have been well met and aided by the Conference of Architects from all parts of the kingdom, from which conference very useful results are likely to arise; that the architectural examination of students seeking our diplomas have met with revived and increasing encouragement; that our offers of prizes, medals, students' prizes, &c., have been responded to not only by satisfactory numbers of candidates, but by a degree of excellency in the competing works of a most encouraging character, while the sketch-books of the medallists have shown a most cheering result. Also that the standing committee for the conservation of ancient monuments has been working with activity. In short, that the Institute has been actively and successfully performing its arduous duties. In the latter document will be seen a list of the excellent Sessional Papers read at our meetings, as well as further particulars as to many subjects which have come under the consideration of the Institute.

The medals, prizes, &c., awarded have been as follows:—The Soane Medallion (with the sum of 50*l*., under the usual conditions of Continental study) to Mr. William Frame, for a design for a public hall; and a medal of merit for a design for the same subject, to Mr. J. H. Eastwood; and the Institute Silver Medal, with five guineas, to Mr. Alexander E. Kersey, for drawings illustrating St. Mary's Abbey, Old Malton; and medals of merit in the same competition to Mr. Thomas Garratt for drawings illustrating St. Mary's Abbey at Lilleshall; and to Mr. Arthur Hill, Associate, for drawings illustrating St. Cormac's Chapel, Cashel. Of the high standard of merit evinced by these several sets of drawings I am able myself to speak in the strongest terms. A medal of merit has also been awarded to Mr. Alfred Jowers, Associate, for an essay on "Modern Architectural Criticism."

It was also unanimously resolved humbly to recommend to her Majesty that the Royal Gold Medal should be awarded to our late excellent president, Mr. Thomas Henry Wyatt, which recommendation was, as you so well know, graciously accepted.

Though the pecuniary condition of the Institute cannot be viewed as other than prosperous, I think that an examination of our annual accounts will be sufficient to afford conviction that our income is not more than sufficient to meet the actual demands of the Institute itself. I cannot, therefore, wholly sympathise with the yearning so often expressed, for a union under our single banner of all the societies bearing upon our art or profession. Had our income sufficed, or could it be made to suffice for all objects, I should rejoice to see all united, and that our Institute should have the credit of all; but, when I see a gift for a most important object in promoting the study of our art only agreed to on an express understanding that the application should not be repeated, and am obliged to acknowledge the conditions, however ungracious it may appear, to have been necessary, I cannot but rejoice that the efforts for our common object take numerous channels, and that no attempt is made at their undue centralisation. Let them be bound together by a bond of common sympathy, but let their finances and their management be several; for, depend upon it, no single list of subscriptions will ever be sufficient to cover the multifarious objects which bear upon an art of such universal application.

Art-education, however, is an object of such paramount importance that, in spite of all discouragement, I recommend it to the special attention of the Institute. As to its finances, it ought, I feel convinced, to be in great degree *self-supporting*, but it ought to be nevertheless, in a greater or less degree, under the direction of our Institute and of the sister Association.

The Royal Academy has of late given greater attention to the subject than formerly, and it has occurred to me that a useful result might arise from a conference between our Institute and that body, though I have not sufficiently matured my thoughts on this subject to enable me to offer any specific suggestions. I will say, however, that I feel very averse to so rigid and straight-laced a system of training as that adopted in France, which seems to me calculated to repel by its slavery rather than to win the warm affections of its students.

It occurs to me, however, that much may be done, both by increasing our library and by adding in every way possible to the facilities for making use of it; and if we have any surplus from our annual income, I would strongly commend that direction as the most profitable for its expenditure.

I will take the liberty of mentioning that two points struck me rather painfully at our professional dinner last June. The first was this,—that the chairman to the Metropolitan Board of Works, when alluding to the proposed demolition of Northumberland House, seemed to state that the Board had been encouraged in pressing that project by the opinion of our Institute. Now, I am not well versed in the subject itself, or in our own course with reference to it, but strongly holding, that in all public improvements, it should be made a principle to preserve both existing public monuments and private buildings which from their importance assume a public character, I trust that I misapprehended what I heard; for though it *may* occasionally become *unavoidable* to deviate from this principle, I should be distressed to think that such deviations should ever be able to claim the authority, or even the connivance, of an Institute which should be, and is, the protectress of all public monuments.

The other point I allude to is this:—In the annual report of the Institute, I find that in announcing the intention of having a professional dinner, it is stated, that "it will afford an occasion for enlisting subscribers to the charity (the Architects' Benevolent Society), by the same means which are adopted in the case of other benevolent institutions." Now, at that dinner no such means whatever *were* adopted, and had it not been for excellent and almost remonstrant addresses from Mr. I'Anson and Mr. Christian, the subject announced as the special object of the meeting might have been almost forgotten.

I take the liberty of alluding to this, for the sake of recalling attention to the subject, and especially to the remarks of Mr. I'Anson and of Mr. Christian: as, with all our professional prosperity, it would ill become us as a representative institution to forget the claims of our less fortunate brethren.

In reviewing the whole subject of the position of our Institute, I cannot but sincerely and heartily congratulate you on its constantly increasing usefulness, influence, and prosperity. Few instances probably can be found even parallel to this, and I earnestly trust that our success may not only be permanent, but may grow at an ever-increasing ratio.

While congratulating ourselves, which we have every ground for doing, on the material prosperity of our Institute, on its happy effect as a common ground of reunion, in which the members of our profession meet on equal and friendly terms;—as a means of producing genial feelings amongst them one towards another, of softening asperities, of rubbing off prejudices and cementing friendships;—as a standard and referee on all questions of professional practice and etiquette, and as the protector of professional honour;—and further, as a society which, by its prizes and medals, encourages and incents to exertion, and at whose meetings instructive and interesting papers are read and discussed, calculated to disseminate the knowledge of matters bearing upon our common art, and the important practical matters which relate to it;—while congratulating ourselves, I repeat, with just pride on our success in all these, and many other ways, which it would be too lengthy to enumerate;—let us never, for one moment, forget that such societies as ours, and others to which allusion has been made, are but instruments to aid in the promotion of the common end and object for which we should all be earnestly labouring;—the raising of the great art of architecture, and the arts subsidiary to it, to that high level which the civilisation and

prosperity of our age, and its advancement in science, in literature, and in mechanical art, *imperatively demand*.

This, Gentlemen, I need not say is the *real*,—the *ultimate* objects of such institutions as ours; and towards *this* should all our efforts tend as the one great central object of our earnest aim, and our heartfelt aspirations.

At all great periods of art, so far as we can gather from historical records, or from the internal evidences so abundantly supplied us by the actual works which have been spared to us, there can be no room for doubt that the efforts, the enthusiastic strivings, and the whole heart and soul of each artist, from the humblest to the most exalted, were ever directed, as their single object, to the advancement and perfection of the art on which they were engaged.

However different, and even contrary, may be the artistic sentiments expressed by the remains of the great Pharaonic period, of the age of Pericles and Phidias, of the Augustan age at Rome, of the age of Justinian at Constantinople, of the twelfth and thirteenth centuries in North-Western Europe, of Arnolfo and Giotto with their host of Mediæval fellow-workers, and finally of that army of painters, sculptors, and architects who accompanied what is known as the period of the Renaissance, works which have defied all their followers to rival;—whatever, I say, may be the difference, and even the contrariety, of the artistic sentiments which inspired these almost superhuman productions of art, one fact is common to them all, one golden thread unites them as it were into one;—the fact, I mean, that they are all the works of men who were devoted *heart* and *soul*, absolutely and unreservedly, to their art; and with whom personal advancement, social position, or any other consideration was as dust in the balance when weighed against the perfection of the arts to which they had sworn allegiance.

Until we can resuscitate among ourselves a like glorious enthusiasm, it is vain to hope for another great period in architecture.

True it is, that knowledge and skill are elements necessary to perfection, but neither one nor the other can be acquired without that burning zeal which pervaded the old schools of art, while its presence impels its possessor to their acquirement, and even goes far at times towards compensating for their imperfection.

Now, though I do not believe that such chronic enthusiasm can be brought about directly by intention, or by any external means, but rather that it arises from a spontaneous excitement of the human mind, apart from deliberate intention, I do nevertheless think that, if once excited, it may be promoted and cherished, or that it may be damped or even extinguished, by generous encouraging sympathy upon the one hand, or by cold-hearted absence of sympathy on the other.

Let us for a moment inquire whether, in our own day, we have had any promise of such a spontaneous rise of earnest enthusiasm as would suggest the possibility of the advent of a great period in our art.

Of individual and enthusiastic zeal we have had much, of which the contemplation is entrancing. Our founder and former president, Professor Donaldson, gave us in his inaugural address a charming sketch of the career of his lamented predecessor, Professor Cockerell, from which, — and we have ample evidence besides,—we can see that that admirable man possessed all the burning zeal and generous enthusiasm, united with that high artistic sentiment and power, which have characterised the artists of the greatest periods. Our friend's own participation in those noble feelings, were not other proofs so abundant, is sufficiently evinced by the earnestness with which he records them; and that they were shared by many others we have only to look to the artistic lives of Barry, and many others of our architects, who have rendered their memory imperishably great, and having arisen during a period of comparative deadness in the art, have laboured earnestly and successfully in instilling into it a new life.

Besides these great men, however, we have in our day been witnesses to a movement in our art, which, however different may be our estimates of its value, can at least lay claim to the merits of having been at once spontaneous and enthusiastic, of having united in a single aim a greater number of persons, whether professional or otherwise, than any other movement of modern times, and of having, to a greater extent than any other been *collective* rather than *individual* in its character, sinking, in a great degree, personal and individual feeling in one great flood of collective ardour.

I need hardly say that I refer to the revived feeling for the study and resuscitation of Mediæval architecture.

Many of those among us who, not having personally participated in this movement, view it naturally from the outside, fail to see in it anything but a deliberate effort to overthrow the previously existing state of things, and to erect in its place the creation of a new fashion. For myself, without laying claim to any primary share in this great movement, but being nevertheless a contemporary of its earliest activity, and having devoted to it an early allegiance, I am able to speak of it, not from the *outside*, but from the *inside*, not as a Laputian critic who, soaring a little above the level of human occurrences, could record them as they passed under his notice without the least personal sympathy in the feelings which gave them birth, but as one within the pale, who has from the first been cognisant of most that has passed, and can speak of it from his own personal consciousness; and in such capacity I am able to assert that the movement has been absolutely spontaneous, and the result of mere love for the study on which it was founded, apart from any hostile feeling towards the *status quo*, and almost free at first from even the thought of disturbing it. If I may speak of my own experience without incurring the charge of egotism, I would say that my own devotion to Gothic architecture began before the thought of my future calling occurred to me; that the choice of my profession arose wholly from that devotion, and that when I subsequently found that my tastes had nothing whatever to do with my practical employments, I still followed them as my almost solitary amusement, with scarcely a thought of their ever becoming the subject of my professional work, which I was for the time passively content should be of necessity in another, and the dominant style.

How this great change came about seems to me as a dream; nor can I clearly recall the manner in which it took place. It seemed to arise spontaneously and unconsciously, the effect of a burning love for the architecture of our forefathers; which, without external cause, without premeditation or concert, had taken possession of the minds of a large number of persons unknown to each other, and only waited its time for practical development.

Nothing parallel to either the cause or the effect has occurred since the great Italian Renaissance! It has not been our doing; *we* have been the mere humble instruments of a great and unthought-of mental movement; and truly its effects are marvellous in our eyes! I have, thus, alluded to *two* great exhibitions of earnest architectural zeal, which have been manifested in our day:—the one tending to the reviving of Classic art from a state of comparative torpor; the other having brought about the actual resuscitation of the architecture which was indigenous among our own family of nations, and which it has re-established, side by side, and on equal terms, with the long-established result of the Classic Renaissance.

I am not going over this already well-trod ground, with any object of partisanship, but simply in search of an answer to my previous inquiry:—*whether in our own day we have had any promise of such a spontaneous rise of earnest enthusiasm, as would suggest the possibility of the advent of a great period in our art*; for, as I said before, until we can resuscitate among ourselves a like glorious enthusiasm, with that which has in former times given rise to the great movements in our art, it is vain to hope for another great period in architecture.

Gentlemen and brother architects,—I put the question to you, to which ever of the two great phases in our art you may have vowed your allegiance:—*Has* our age been unmarked by such noble enthusiasm? *Have* we lived in days when everything has gone on in its wonted course, unruffled by any special movement, undistinguishable from any other period of equal length in the smooth current of undisturbed art history? The *very reverse*, I boldly assert, has been the case, and the proofs of it are no matters of past and recorded history, but are within the range of our memories, are coincident with the existence of this Institute, and are the motive causes of our own daily acts.

Yes:—it has been our own privilege to live during the days of great mental strivings,—of deep and earnest enthusiasm in our art: and though, unlike the great periods of old, our art camp has been divided, and we must be content to work in two parallel courses and in two diverse styles, we have a right,—nay, we are in *duty bound*, to ask ourselves, whether we are doing each our duty by the great period of mental up-stirring, in which it has been our lot to be placed; for, I repeat, that such mental movement *may be* promoted and cherished, or that it may be damped, and even extinguished, by our own conduct towards it.

The first question which suggests itself is, do *all*,—does each in his chosen camp, and each according to his abilities and opportunities,—strive to the utmost to do his work *well*, and to fit himself for doing it in a manner characteristic of a period of earnest onward striving?

Now, one of the most marked characteristics of the productions of the great periods of architecture is this, that, though the works of any one of them differ in artistic merit,—some displaying the highest genius, others only comparatively unassuming correctness and propriety,—yet no *really bad* architecture is ever to be found among them. From the most majestic and glorious building downward, to the least pretending, the same matured knowledge, and the same careful, thoughtful working, is found ever to prevail. Who ever heard of a work of the Greeks at the great period of their art which they would presume to call *bad* architecture? Even in Byzantine art, though it laboured under great disadvantages, we have proofs in the ruined cities discovered in Syria, that these buildings of the more vernacular classes were as carefully studied as the mighty works by which their architecture is better known; while in works of the twelfth and thirteenth centuries in our own and neighbouring lands, as well as in Italy, the same masterly skill, and the same studious handling, are found in the simple village church as in the noblest cathedral,—nay, one is often disposed to uncover oneself in humbled reverence before the work of some unheard-of mason or carpenter in an obscure village, of which we had never before so much as heard the name; nor did these old workmen,—so unambitious of fame,—ever produce work to the like of which the best or the most self-satisfied among ourselves need be ashamed to attach his name.

Now,—is such the case among ourselves? It is worse than idle to attempt to blind our eyes by bland felicitations or to seek the bliss of a fool's paradise;—let us rather look facts boldly in the face; and if they prove unpalatable, let us make it our business to correct them.

The true answer to the question is, that no contrast could be more marked than the difference in this respect, between the present state of things amongst ourselves and that which prevailed at the great eras alluded to.

Instead of all works (each in its own style) displaying the same instinctive sentiment, the same understanding of its style of art,—the same careful, wise, and thoughtful handling,—*the very reverse* of all this is actually the case. From each of our art-camps, productions are put forth of the highest, and of the most contemptible, character, as well as of every intervening stage of merit and of demerit. Our age and country will hand down some works of which no age or country need be ashamed, and others at which any age or country, however degraded its art, ought to blush; while I fear a large number of the buildings which will represent our period will be of that negative kind which, being neither hot nor cold, but only lukewarm, will not tend to excite any but a sickly emotion.

Among the works of the classic school, and more especially among those of a civic and mercantile class, one is, in passing along our streets, often quite startled and taken aback at the excellence of individual works, while, perhaps, next door to them, one sees others displaying all degrees of want of skill and knowledge, or of ill-instructed and worse-effected attempts at originality; while in our provincial towns one often sees, perhaps, a building rivalling in merit those of the best ages, and others, the mechanics' institutes, corn exchanges, and such like buildings, the execrable results of those competitions which seem to be inaugurated rather for the amusement of ignorant committees and town councils, than in any wish or aim at adding honour to their towns by a work of good architecture, however unpretending.

In the Mediæval school the same unpleasing fact stares us in the face. On the one hand we may felicitate ourselves that there exists a band of true architects, who produce works of a high,

and some of them of the highest, degree of excellence, such as one would fain believe would be acknowledged by the architects of the best age; while, on the other hand, we are disgusted by the works of a host of mere pretenders, who wholly unconscious of their ignorance and want of skill, disfigure our towns and our country with buildings either so utterly contemptible as to be beneath the lowest grade of criticism, or so sickening in their mediocrity that one wishes they were either cold or hot, as some more pronounced degree of demerit would be almost a relief from their mawkish inanity.

I exclude from my censure upon our two great schools those works, most of which we know, and all of which we may hope are not the works of architects at all.

We have recently seen marvellous statements as to the number of dwelling-houses which have, within the present century, been erected on our land.

Though, personally, we are, for the most part, innocent of these, I would put it to our two great schools of architecture to say what proportion of these are not a disgrace to our age and a blot upon our towns and our country! The exceptions are, happily, numerous, and in many cases actually brilliant; but they bear no proportion to the immense comprehensiveness of the rule. If the erection of this multitude of houses, instead of being crowded into three-quarters of a century, had been extended over five centuries, counting back from the middle of the last, few indeed would have been the number of those with which any serious fault could be found; and, if we were to concentrate our period a little more, one may almost say that on nearly all one might have looked with some degree of satisfaction. It has been reserved to our own age,—the age of mechanical and scientific progress,—to deluge our land with an inundation of brick and mortar and compo, more degrading in its forms than any previous period has produced. This plague of nearly unmitigated barbarism is so inveterate that one sees no means by which it can be remedied, except by so absolutely elevating the art produced by members of our own profession, however unpretending their position, as to reflect of necessity its merit upon those of the non-professional builders beneath and around them, and to produce such an atmosphere of tolerable art that it may become impossible for such atrocities to continue to be perpetrated.

There is, however, a yet sadder form of inequality to be recorded,—sadder because irreparable in the injury it has inflicted. The million of ugly houses, or the evil majority of them, may go to decay or be rebuilt; but a single ancient edifice destroyed or ruined by ignorant "restoration" can never be recovered.

It is unquestionable that the ancient structures, from the study of which a knowledge of our Mediæval styles has been resuscitated, had suffered for the most part so severely from neglect, ill-usage, and decay, as to demand the aid of a loving and careful restoration; and this they have, happily, in very many instances, received. The knowledge and skill of our non-Mediæval architects has often been devoted with admirable success to this grateful work, and from among the restorations of ancient buildings may be instanced many of the most happy results of the Gothic revival. But here, again, the unhappy diversity I have alluded to, as existing in our new works is found to exist in its most aggravated form. Our old buildings, too often,—nay, in a majority, I fear, of cases,—fall into the hands of men who have neither knowledge nor respect for them; while, even amongst those who possess the requisite knowledge, there has too often existed a lack of veneration,—a disposition to sit in judgment on the works of their teachers,—a rage for alteration to suit some system to which they had pledged themselves in their own works; and even the preposterous idea that the ancient examples they were called upon to repair were a fitting field for the display of their own originality!

Nor have the official guardians of our ancient buildings exercised much restraint upon these vagaries; on the contrary they have too often been most culpably careless as to the hands to which they have committed their trust, and are usually the inciters to ignorant tampering, the needless removal of valuable features, and even to the condemnation and destruction of the buildings under their charge. The result has been truly disastrous—so much so that our country has actually been robbed of a large proportion of its antiquities under the name of "restoration;" and the work of destruction and spoliation still goes on merrily, while at the public festivities by which each *auto-da-fé* is celebrated, we find ecclesiastical dignitaries, clergy, squires, and architects congratulating one another on the success of the latest effort of Vandalism. Our Institute has done itself infinite honour by appointing a Standing Committee to investigate and protest, and by publishing a code of excellent suggestions as to the mode of dealing with ancient remains; but still the work goes on, and the equivocal motto of the *Ecclesiologist*—"Donec Templa refeceris" seems likely to prove well-nigh the death-knell of our ecclesiastical antiquities.

I fear I shall be thought to have painted the darker side of our architectural status with greater perspicuity than its brighter side. I do not intend this, as I have a very hopeful appreciation of the happier circumstances of our position; but it is of little use to congratulate each other on our successes if we fail in courage to confess and denounce our radical failures. I trust, therefore, you will have patience with me if I spend a few moments in suggesting some of the possible causes of the inconsistencies we deplore, leaving to your own consideration the means of removing or abating them.

One would have imagined that there would be no such thing as a really ignorant and thoroughly unskilful or cold-hearted architect; that the spirit-stirring nature of our art would have rendered the existence of such a person impossible; and I am convinced that at the great periods I have so much dwelt upon none such did exist; but during a dull period, such as has preceded our own, architecture came to be viewed by the public as a *profession* rather than as an *art*—as one of the quarters in which a youth could be provided for, rather than as a glorious field for the exercise of mind, imagination, and zeal. Just as the Church was viewed by a former generation as an institution providing for sons rather than for saving souls, so has architecture been dealt with as a *means* of *living* rather than as one of the noblest employments of life; and in choosing it as a profession the question has too often been decided by the prospect of a good connexion rather than by evidences of any zeal for the art.

It has happily been the case that at all times, however dead, a goodly number of ingenuous youths have allied themselves to our art from the highest motives, and this has of late years so rapidly increased that I am convinced that it is becoming rather the rule than the exception; yet I cannot but fear that the old leaven of *professionalism* versus *art* has been one cause of the extraordinary contradiction I have been attempting to chronicle. This evil does not *necessitate* ignorance, it is true, but it *induces* it; for though a man, in spite of a non-inclination for art, may study it from a sense of duty and interest, this is hardly expected to go far; and a youth so circumstanced, however conscientious, is far more likely to devote his attention to the far more business-like and practical parts of his profession, from which he can most clearly perceive the advantages to be derived, than to those more refined studies of which he feels, perhaps, too little appreciation to be conscious of his defects, not to mention that many young men are naturally so little given to application of any kind that, if they lack the internal fire, they will never bring themselves to that zealous study which is essential to excellence.

A second cause,—and perhaps the most damaging of all,—is, that the public, as a body, really scarcely perceive the difference between good architecture and bad; so that one of the young gentlemen I have alluded to, if he has tolerable introductions and good address, and fair business habits, is really as likely to get on as if he possessed the higher qualifications: nay, I could name many young men of the highest promise who are at this moment *actually languishing* for employment, while others almost innocent of art are making their way prosperously.

This bears directly upon the third cause I would mention—competitions as now conducted; for what can we hope from them if the judges are known to have no kind of perception as to whether a design is good or bad? Competitions have thus become a mere lottery, into which the most ignorant and unskilful may throw his design; and, provided he gives a low estimate and makes his drawings look smart, he knows that "the race will not be to the swift nor the battle to the strong," but time and chance may happen to any; and even if professional or amateur judges be appointed, it may at the best be decided by the fancies of an individual or a clique.

Another—I will not say *cause*, but—*promoter* of this state of things, is the prevailing style of architectural criticism; for, much as our profession is held up to public scorn, one rarely sees a word said against the mere offal of our art, which is the great disgrace of our age; nearly all which appears is against those who have really their hearts engaged in their work, and are enthusiastically aiming at a high standard of art. These are singled out for depreciation, I know not by whom nor with what motives; nor would I care to inquire. Of such critics I would rather say, "O my soul, come not thou into their secrets." Yet, however this may be, it obviously has the effect of encouraging those who employ inefficient architects, and of making the public the more satisfied with their own want of perception.

The next cause, or promoter, of the evil in question to which I will allude, is the want of concert, of mutual sympathy, and of a common aim among the most earnest-minded architects themselves.

I am not alluding to the diversity between the standards of the two great camps into which we have become divided; I doubt whether much harm would come of this, were those who occupy each camp of one heart among themselves. Neither in one, however, nor the other, can this be said to be the case. In neither is one style so prevalent or so paramount as to be clearly the style of the day; in both eclecticism prevails almost to the extent of dissipation. One man has a "fad" for one shade of style, another for another; and, if common opinion seems for a moment to be settling down into a single channel, this is but a signal for revolt, and in a few years that promised bond of union becomes a mere term of reproach,—the one thing of all others to be scoffed at and rejected. Meanwhile our camps are visited by that great enemy of union and sympathy—self-conceit. I do not refer to that noble self-reliance which gives a man courage for his work, however difficult; but that lower sentiment, which too often makes him scornful of his fellow-labourer, however true-hearted; and by means of mutual scorn and depreciation, tends to encourage those whose innocence of art keeps them beyond its range, and warns the careless public against the employment of those who thus bear witness one against another.

I will close my list, by suggesting one of the difficulties of our day to be the absence of any recognised means of instruction in, or facilities for, the study of the higher branches of architectural art. This difficulty may, it is true, be met and overcome by the zealous; but it affords a practical excuse for the neglect of the study of our profession *as an art* by those who lack enthusiasm. It is "the lion in the way," which is sufficient to deter the apathetic from exertion.

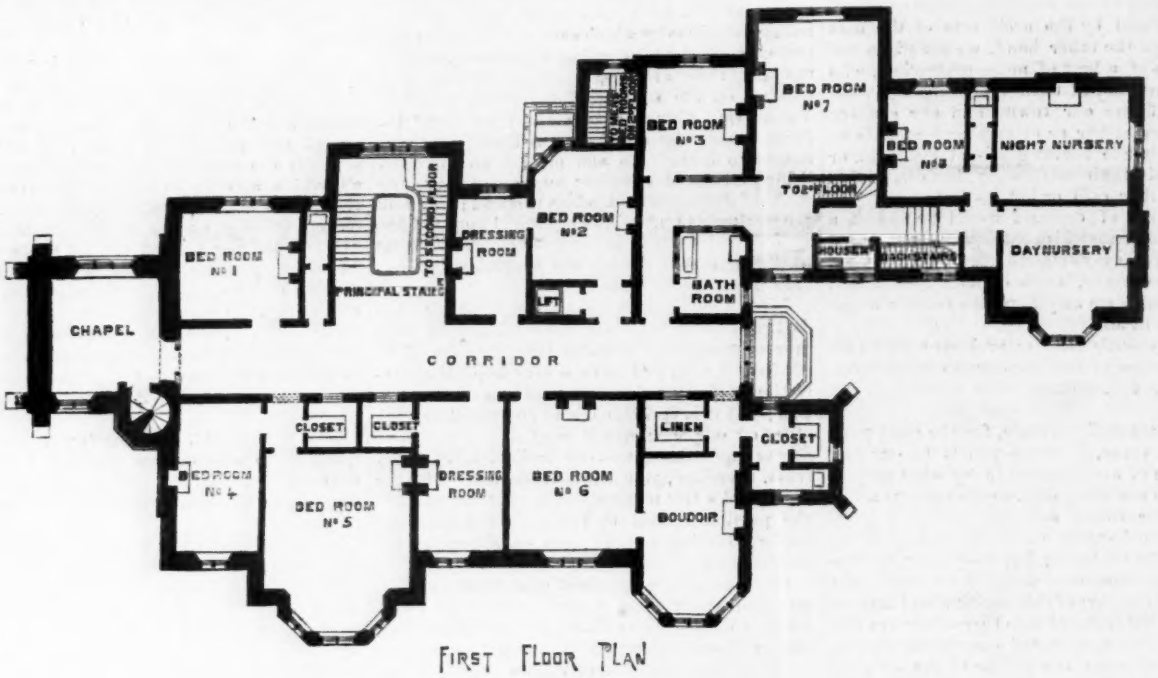
I am conscious that I utterly lack the sagacity to suggest a remedy for all these inherent evils, which seem to drag us back from the goal at which so many are sincerely aiming. I would, however, commend the question to the united wisdom of the Institute, as one of the most important considerations on which it can engage itself.

With every apology for the length to which my address has extended, and for its plainness of speech, which has been so far from being personal, that in my allusions to the defects in some of the architecture of our day, I have in no one instance had a specific architect in view, and feel that I may have myself challenged a *tu quoque*, I now bring my remarks to a conclusion with repeated congratulations, good wishes, personal thanks, and appeals to your kind forbearance.

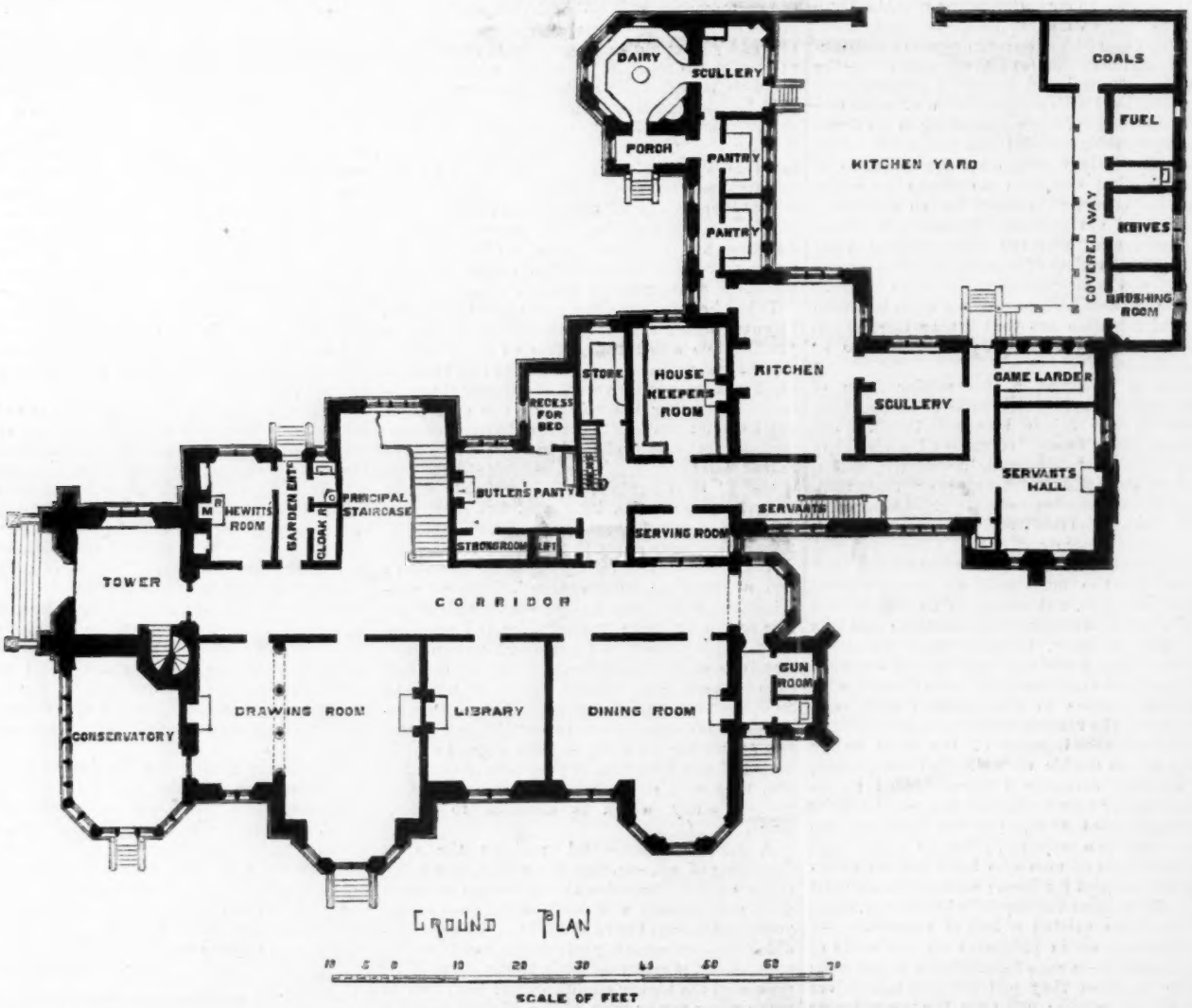
GEO. GILBERT SCOTT.

ENLARGEMENT OF THE ROTHERHITHE INFIRMARY.

THE infirmary at Rotherhithe has for some time been found inadequate in size, the number of wards being unequal to the number of patients seeking admission. Under these circumstances the St. Olave's Board of Guardians, on the recommendation of the Local Government Board, have decided to make extensive additions to the building, which will shortly be commenced. The estimated cost of the additions is 12,000*l.*, and at their meeting last week the guardians resolved to borrow this sum, the amount to be repaid in thirty annual instalments.



FIRST FLOOR PLAN



GROUND PLAN

SCALE OF FEET

HOPE END, NEAR MALVERN.

HOPE END, NEAR MALVERN.

THE new mansion at Hope End is being erected for Mr. C. A. Hewitt in a commanding position between Malvern and Ledbury, in place of the old house now being pulled down, which was built about seventy years ago at the bottom of the valley. The new house is being built of local red sandstone, with dressings of Bath stone, and is to be roofed with dark red tiles.

The reception-rooms are all placed on the south front, which commands the most extensive view.

The kitchen and offices have a north-east aspect.

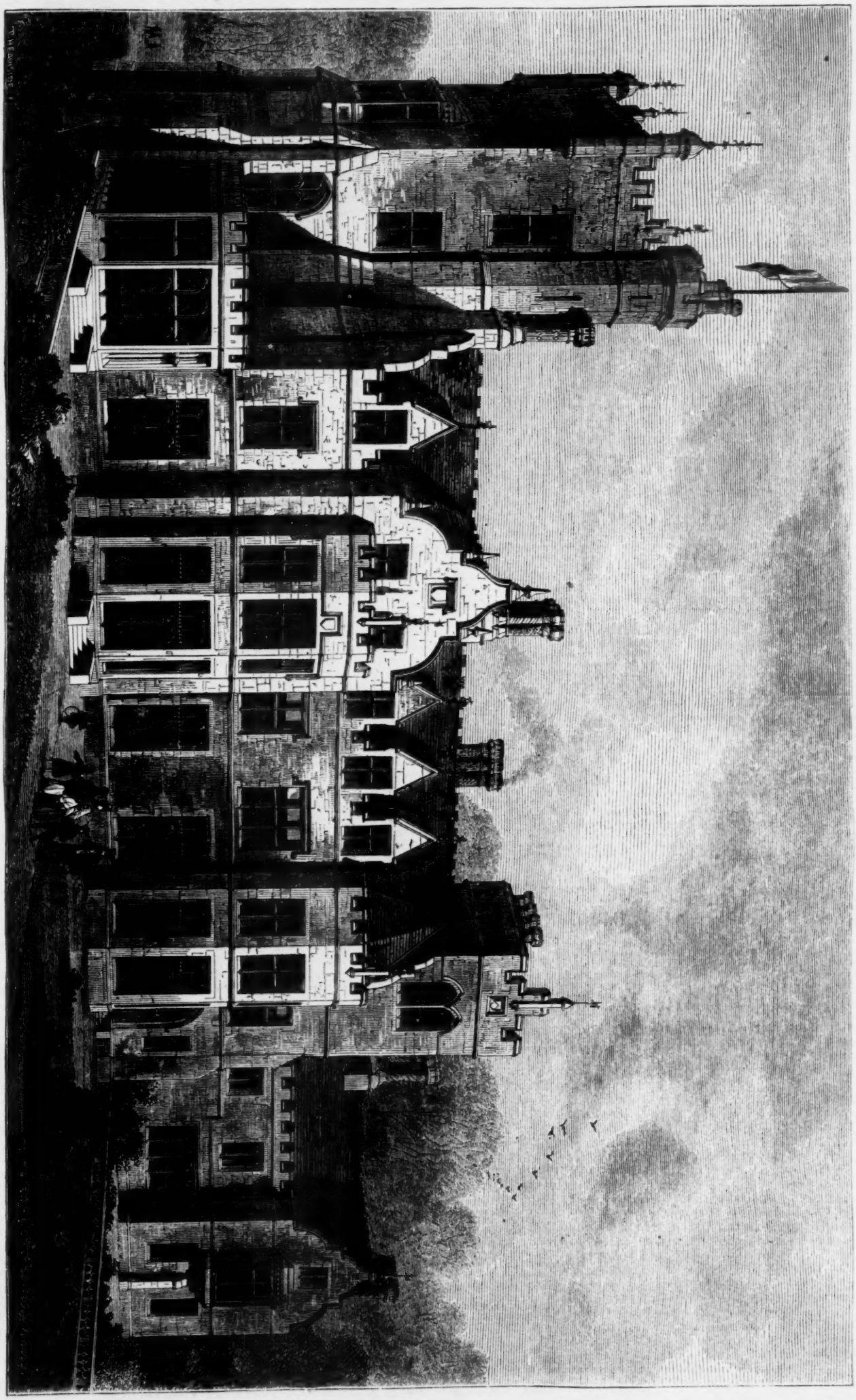
In the basement are placed wine and beer cellars, larder, &c., also the apparatus for heating and ventilation.

The chapel, and the smoking-room in the upper part of the tower, are approached direct from the entrance-hall by the turret staircase, as well as from the upper floors of the house.

The men-servants' rooms on the second floor are approached by a separate staircase from the ground floor.

The corridors and staircases are all to be fire-proof.

The building is being erected by Mr. Tongue, of Plumstead, from the designs of Messrs. Habershon, Pite, & Fawckner, of London.



MANSION AT HOPE END NEAR MALVERN.—Messrs. Habershon, Pite, & Fawckner, Architects.

PUBLIC WORKS REFORM IN INDIA.*

It has been too common an idea in England, notwithstanding our knowledge of the ancient temple and palace architecture of India, that the Hindus are without an engineering history, that there are no works extant of their engineering skill, and that they owe to us all that they possess in that department. Col. Tyrrell shows that such is not the case. India *has* an engineering history, marked by works whose usefulness may vie with works of any other nation,—works on which her life depends.

Some parts of India, particularly the south, are covered by a network of tanks; they are found, however, all over India, and the ruins of some bear witness to their immense size. Their number and extent, and presence all over India, prove the general idea that was felt of their necessity. In order that we may have some notion of their size, he gives the dimensions of four large tanks now in existence, and there are even larger ones:—

District.	Name of Tank.	Height of Band.	Length of Band.	No. of Villages Watered.	Annual average Revenue to Government.
		Feet.	Miles.		Rs.
Mellore	Connigherry Tank.....	20	2	23	78,000
North Arcot	Cauvenpaukum Tank	45	4	23	43,000
Chungleput	Chumbrumpaukum Tank.....	25	3½	58	49,000
South Arcot	Veeraunum Tank	21	9	149	114,500

To the east of Hyderabad in the Deccan, and of Nagpoor, and even as far east as the Boad Country in Orissa, the remains of tanks are numerous,—showing that at one time, even in those wild tracts (where at present there is little besides jungle) there was a thriving people.

The ancient engineering works of India in the south are, with the exception of tanks, neither very numerous nor well executed. The ancient Hindoo buildings are, in fact, more of the nature of curious works than works of engineering skill; they are, in many instances, extremely solid and strong, but the arch is seldom met with. Huge stones cover their temples, as in Humpee or Bejanuggur, founded by Virjza Ragu, A.D. 1119, on the banks of the Toongabudra; some of these measure 24 ft. long by 4 ft. wide, by 1½ ft. thick. The chief attraction of the ancient Hindoo temple is, however, generally the elaborate carvings of figures, &c. The old bridges met with in India are not built on very scientific principles. These generally rise very high in the centre, with a gradient often of 1 in 6 to 1 in 10; there is generally a great want of waterway, and the approaches are often covered with water during floods. The old annicuts on the Coleroon and Toongabudra and other rivers are not neat constructions; they, however, gave us the idea, and are the foundation of our most successful irrigation works. The chief works executed by the old Hindoo rulers were tanks, of which there were thousands; many silted up, many in ruins, many dry by destruction of the supply channels.

In Central India, and towards Bombay, we have many curious works, but not very instructive in an engineering point of view; such are the tombs of the Ghond Kings at Chanda, the forts of Gawilghur and Narnulla on the Satpoora range of hills, about 3,000 ft. above the sea, built extremely massively of black basalt, quarried on the spot; the lime must have been all brought up from the plains with great labour on the backs of bullocks. These forts were taken by Lord Wellesley in 1803. We have then the caves of Adjunta and Ellora, near Roza, and the caves of Elephanta in the harbour of Bombay; the former were doubtless used by the Brahmins for religious purposes, and at an earlier period by the Buddhists. Col. Tyrrell is of opinion, however, that they were originally Egyptian in idea. The capitals of the most ancient columns have a strong resemblance to the Egyptian form, and the paintings which formerly covered the caves of Adjunta were painted on a material and with pigments exactly corresponding with those found in Egypt; and, comparing the figures themselves, there is often a striking resemblance; in some instances, one could well imagine the Egyptian idea depicted by an Indian hand. These temples were cut out of the amygdaloidal trap by a pick; the marks of the tools are still visible. The work was doubtless laborious, but required but little skill and no science.

The ancient Mahommedan rulers left us noble examples of architecture,—elegance of design, massiveness, and science in construction. The Taj at Agra, and its very inferior copy at Aurungabad, are good examples of masonry. There are also some fine examples of stonework and scientific construction in the Mohammedan remains built by Yoosuf Khan in 1849, around the very ancient Hindoo city of Vijzapùra. They were also aware of the importance of canals, and commenced our present system in the north. Thus the history of native engineering in India as regards the Hindoo is not brilliant, but it was useful. Yet we, with all our boasted science, have failed to do what the Hindoo did in a most efficient manner in many parts of the country (see a map of the Tondeman's country south of Tanjore; it is a network of tanks); that is, store water all over it. We have taken water by annicut in the large deltas, following the example set us by the natives; but in storing water against an insufficient monsoon, we have done scarcely anything; yet this is the great want of India to protect her from those dire famines, when the dead may be reckoned by tens of thousands. The matter is, however, it is acknowledged, one of difficulty. The ancient Hindoo was fully alive to the necessity of storing water, more so than we are,—being only birds of passage; and the necessity has not as yet penetrated the Government: the Hindoo had a power we do not possess; he turned out the whole of the inhabitants of a district, and made them make their own tanks by compulsory labour. We do not behave in this way; but the raising funds by local taxation and municipal officers would appear to be our remedy.

Since Captain—now Sir A.—Cotton wrote in 1837, we have done much for India. We have struggled on; we have changed much; we have made many miles of railway, and have considerably increased the engineering establishment; but we have not, by any means, grasped the magnitude of the work to be done, nor the vastness of the interests at stake; nor have we yet become alive to the radical errors of our system. Considering the vastness of the country, the immense sums required, and the large number of qualified men that the works would demand, it may have been, perhaps, impossible to have moved faster than we have done. But surely the following conditions of the Public Works Department in India, pointed out by Col. Tyrrell, must be now patent to all, viz.:—

"That, notwithstanding the checks and counter-checks, work is unsatisfactory in the highest degree; that true responsibility is *nil*; that the resources of the country are by no means adequately used or developed; that native talent is altogether ignored; and, finally, that the time has arrived for a thorough reformation of the department commensurate with the just demands of the country and our duty towards it."

After briefly describing the present system, Col. Tyrrell thus proceeds:—

"To commence a review of the system that I propose, I will state, first, the training that the young engineer should undergo, and then follow him up, until I build up the whole system as I would suggest it. Before doing so, I would preface it by repeating and laying down certain broad principles that I consider our rulers are bound to observe in dealing with India. First, I would observe that the establishment of any engineering department should have for its object not merely the development of the resources of India, but it should also equally and primarily aim at the development and advancement of the intellectual and practical knowledge of the natives, and teach them not only to work, but to design. Secondly, that any engineering establishment must be the most economical and simple that can be devised, and not made with a view of finding high pay for a number of European officers, but made solely with a view to bring out the resources of India, intellectually and materially, in the quickest, least expensive, and most efficient manner. To obtain this object the following arrangements would be necessary. There should be Government colleges or schools at several large towns,—say Poonah, Calcutta, Roorkee, Madras, and Hyderabad, or a less number should these be found too numerous. Here the native and European would have to pass a certain standard in mathematics, natural philosophy, &c.; and Europeans would have to pass in one of the native languages. The instruction would be in English. In several of the towns mentioned above, there is an embryo of such institutions. Men, however, who had gone through the same course in England, could pass the required examination in England, and then go through the second practical course (now to be mentioned) also in England, but would have to pass the prescribed examination at the Indian practical school after a sojourn of six months or a year, and passing in one of the native languages. These men, having already acquired practical knowledge in England, would receive some small pay, as probationers, during this time of service. This second practical stage has to be created; and this it is that I would lay the greatest stress on. Practical schools of instruction must be established. After a lad has passed out of the initiatory theoretical school, he should be sent to an iron manufactory and engine shop, or should be sent to some large works in progress, where he would find Government instructors to teach him the higher branches of his profession, and where he should pass through a practical training in masonry, bricklaying, carpentry, &c., or acquire a certain knowledge of iron-work and machinery.

The practical schools would be established for the time being at any extensive work or works where there were workshops. The student would there find a Government instructor in each branch. For fitters and moulders, and for the study of the different branches of working iron, there would be provided permanent instruction in the iron manufactories, &c., that I propose to establish. It might also be found convenient to establish a manufactory or manufactories for doors and windows and woodwork generally, where wood could be easily procured, and thus save much expense in haulage of raw material. But for foundations, for bridges, for masonry generally, railway work, plate-laying, &c., the student would be placed under some Government official on some work in progress, whose duty it would be to see that the pupils under his charge worked practically, and also acquired the knowledge demanded of them.

And here I would point out that India is the proper field for the student of the Indian Public Works. There are peculiarities in many things that do not strike the theoretical man."

After pointing out some of these peculiarities, he continues:—

"Let us go back to the engineering course. We have now the pupil in the initiatory school, the student and apprentice at his practical work, learning the routine of an engineer's office, and the general supervision and measurements of work, management of workpeople, and the chief practical parts and details of his profession, before he becomes able to fly alone. After passing his term in the practical school—say two years, it could not well be less, for building, and five years for a fitter—he could pass into some executive engineer's office, as an assistant, after passing his examination, either as a mechanical engineer or architect, or hydraulic engineer. He would now be brought, on the strength of the Department, as a paid member. Until the native pupils could vie with their European brethren in practical knowledge and efficiency, they would find posts in subordinate ranks as assistant executive engineers, as assistant-accountants on works, or assistant-overseers over repairs, or be placed in charge of stores. The assistant engineer would be promoted entirely by merit, and would be placed at such work as he showed the greatest aptitude for. These men would eventually form the body of Executive Engineers. From these would be chosen the Superintending Engineers and Chief Engineer. These are the officers of the Department, Public Works, and their training.

The Department over which these officers should have control would require to be entirely remodelled. At present a man is too often called on to perform that which is physically impossible, and to apply himself to too many branches of his profession. This is neither fair nor advantageous to the Departmental officers nor to the taxpayer.

The Department would therefore be divided into four grand divisions, to each of which there would be a Chief Engineer and Council, composed of the Chief Engineer; two Superintending Engineers of same grand division; and two civil officers, or commissioners of the district. The grand divisions would be:—1. Military buildings, &c.; 2. Communications, roads, and civil buildings; 3. Railways; 4. Irrigation.

List of officers of the Public Works Department for each grand division:—One Chief Engineer and Secretary to Government Military Grand Division; one Chief Engineer and Secretary to Government roads and civil buildings; one Chief Engineer and Secretary to Government railway; one Chief Engineer and Secretary to Government Irrigation; Superintending Engineers for each grand division, as may be required; Executive Engineers, four classes, as now, for each grand division, as may be required; Assistant Engineers, two classes; overseers, two classes; store-keepers, two classes."

Col. Tyrrell then proceeds to describe the duties of the different grand divisions, then of the several officers, &c.; and afterwards gives a general sketch of the accounts that would be required from each.

Such is the course he recommends and slightly sketches. He does not put it forward as an organised scheme; but what he wishes to impress on Indian officials and the Indian public is, that there must be, in any remodelled scheme of public works, a clearly defined responsibility and a simple system of accounts; that men shall be chosen for their practical knowledge of work, and shall fall or rise by merit alone; and let all acknowledge and act up to their duty of developing native intellect and native resources as much as protect the pockets of the taxpayer. We are not justified in making the inhabitants of India pay exorbitant prices for iron, for example, when it lies in inexhaustible quantities at their very doors; nor are we justified in dragging her sons to England to learn a profession that must of all others affect most seriously and beneficially the physical and moral condition of India, when that profession can be better learnt in India.

In the year 1871–72, 168,049 tons of material, costing 707,765*l.*, besides 223,617*l.* for freight, were sent to India. In 1872–73 the price would

* Public Works Reform in India. By Lieut.-Col. Tyrrell, Madras Army; formerly Executive Engineer Public Works Department. London: Bumpus, Holborn-bars. 1873.

be doubled, and the price will increase year by year. This is doubtless good for English iron trade, good for English shipowners. But is it right? Are we never to rise above our old appellation, a nation of shopkeepers? The price of iron is now so high, and the price of coal likely to remain a difficulty, that we must perforce commence earnestly to develop the immense resources of India in this respect. Then let us manfully do our duty, however tardily commenced. Our difficulties are removed; with a little patience and perseverance India may not only supply her own material, but work with her own brains.

Finally, concludes Col. Tyrrell, there is nothing that promises so well for the rapid advancement of India as the thorough development of her iron and coal trade, and the education of her sons to work out that development. No reform of her public works will succeed without the honest cultivation of native talent and the promotion of her material resources. *Salus populi suprema lex est.*

PORTLAND CEMENT.

Sir,—Regarding the strictures in your paper upon the alleged "Failure of Portland Cement" as most important to architects, builders, and others, I have often desired to communicate my thoughts, but for several reasons I have previously refrained.

If the concrete roof of an underground building can be so finished as to allow loaded lurries to pass over, thus exposing it to weight, wear, and weather, it goes to prove that Portland cement will not fail if properly treated. If factories can be fire-proofed in 10 ft. and 12 ft. spans of arches,—the bays being from 30 ft. to 40 ft. long,—and the top of the arch doing service as a floor, carrying all machinery, &c., without any other support than the ordinary iron beams, I think any other kind of work may be done with the same material, and I can point to several works such as indicated.

I venture to give the following as truisms:—

1. With bad cement good work cannot be done, care and good workmanship notwithstanding.

2. With good cement bad work may be done, by (*a*) improper ballast, (*b*) improper mixing, (*c*) injudicious working.

3. With good cement, clean sharp rubble of proper size, properly mixed in right proportions, and handled by a good workman accustomed to cement work, failure is impossible.

4. It would be just as wise to allow the use of soft, insufficiently burnt bricks, set with inferior mortar by unskilled workmen, and then cry out against brickwork, as to say that because *some* concrete is not good "Portland cement fails."

I hazard nothing in saying that best Portland cement, if properly treated, cannot fail. I have blocks of cement concrete, now (and have been for years) lying about my yard, and are hard just in proportion to their age. Good concrete hardens by time and exposure,—bad concrete perishes rapidly.

I have been engaged extensively in the cement concrete business for some years past,—often using many tons per day,—and I can assert confidently that every "failure" can be traced to ascertainable and perfectly natural causes,—such as I have indicated. The fact is, that whilst almost any person may determine good bricks from bad ones, good stone, &c., from bad, not one in five hundred can detect bad from good cement,—till all the damage is dohe. Not all the materials about a building require half of the constant attention that cement-work does.

In the majority of cases, as cement-makers can testify, inferior cement is preferred by ordinary users. But how few can,—miller-like,—judge good cement by the mere handling of it? Yet this may be done after years of study and close attention; and if cement-work is to occupy its proper position in the building trade, it can only be made to do so by persons who will make a speciality of it.

I have not by any means found that the high-priced cements are the best, but often to the contrary.

All cement-makers turn out some cement worse than their best; but some makers cannot make good cement, often for want of the proper materials. Much of the cost of cement depends upon the quantity of coal used. Good Portland must have considerable burning. The high price of coal reduces the chances of obtaining good cement. Manufacturers may learn some day that the best way to destroy their trade is to teach the public that the quality of cement cannot be depended upon.

Malcolm Macleod.

Some Portland cement manufacturers, in reply to the assertion of one of our correspondents, that cement-makers produce three kinds "or qualities, viz., good, bad, and indifferent," assert that they make but one article, and are careful that all buyers shall be well served. "There are many other respectable houses in the trade who, we believe, act upon the same rule. Therefore, 'Zeta's' statement, applied in a general way, would manifestly convey a false impression, which we shall feel obliged if you will correct." We insert the statement, but that a great deal of cement lately used has failed is undeniable, and, indeed has not been denied. It is in the interest of all that we seek to learn the cause, and prevent a recurrence of the evil.

DEFENCE OF SHAMS.

Sir,—My letter in defence of shams was not written in the "*interest* of art," for which, from Mr. Proud's point of view, I care nothing, but in the *service* of humanity, for which I care a great deal. That art which has no reference to the civilisation of the nineteenth century has, I am bold enough to say, no hold upon my sympathies, and posterity will, to my way of thinking, be best served by those who strive to do well the much-needed work of their own time and generation. That "art which sits humbly at the feet of her great mistress" is not the art we most need; and Nature herself, outside of Mayfair, is not always the mistress at whose soil-stained and travel-torn feet an average lover would care long to sit. The office of handmaid to Dame Nature is not a sinecure, and the "rose and lily" of poetry owe much to the "paint" of modern floriculture.

What more can I, the practical worker, say to Mr. Proud, the dreamer? Does he need to be told that the "works at which the old masters so lovingly and patiently wrought" can never be known to the thousands condemned to toil through life in something more than brutal ignorance of nature and of art?—that thousands dwell where the first is only the sky above and the tradition, perhaps, of fields that once were thereabouts, but are no more; where art is that of the labouring bricklayer and the sanitary commissioner? The walls of the tenements protect the inmates from the worst of the weather, and the common privy, which is the central structure of the courtyard, has at last a decent roof. There is water, too, for the pumping, though the fastidious may still object to its proximity to the cesspool. But there are no "shams" here. Those wicked and "devil"-born abominations have not yet displaced or covered up "things honest in the sight of all men." So "honest," indeed, are all the surroundings, internal and external, that no devil of any pretensions to taste of any kind has ever been suspected of even visiting them. And as the dwellings, so are the dwellers; for humanity, chameleon-like, takes colour from its surroundings.

Will Mr. Proud think of these things, and let us know how the art of his imaginings will here carry out its lofty mission? And will he permit me to suggest that his reasoning may be quite as forcible if the language used be not made studiously discourteous?

C. Henry Whitaker.

IMPROVEMENTS AND BUILDINGS IN ILKLEY.

The rapid transformation which has taken place of late years in this charmingly situated little town furnishes a striking illustration of Yorkshire enterprise. The thatched village has been supplanted by the well-built, thriving town. The change, however, extends only to the style of architecture, the opening out of new roads and drives, and the greatly increased number of houses and semi-public buildings. The natural features of the landscape are, if anything, improved by the new phase entered upon, the slopes of the hill on which the town is built every year receiving fresh ornamentation by the erection of pretty villas, with appropriate plantings of trees and shrubs. Amongst the most recent schemes is the erection of a large family hotel, which is to be commenced forthwith. The opening of the short line of railway from Bradford and district, and the probable creation of a military camp in the neighbourhood, have influenced a few gentlemen to take this step, in the belief that such an establishment is much needed, and that it will contribute to the prosperity of Ilkley. The new erection is to be called the Victoria Hotel, and is being promoted by the Ilkley Hotel Company, Limited. The external dimensions of the building will be 167 ft. by 62 ft. wide and 62 ft. in height. It will be carried out in the Italian style of architecture, the more prominent features being equally distributed on two frontages. The intervening land between the hotel and the river is intended to be laid out in terraces, with gardens and croquet-grounds, &c. The architect is Mr. George Smith, of Bradford. from whose designs many of the private residences at Ilkley have been erected.

Active steps are being taken towards commencing the erection of the Home for Convalescents which Mr. Charles Semon, of Broughton Hall, is about to build at Ilkley. Plans have been prepared by Mr. George Smith, and tenders are now sought for the necessary works, which will be commenced forthwith. The building will occupy an elevated site, overlooking the valley of the Wharfe. The Home will have a good approach by Queen's-road and West Wood Drive, and will stand in its own grounds of six acres. The building is intended to be substantial rather than ornamental: its style of architecture, however, a domestic Gothic, will be in harmony with the site and with the style generally adopted in the vicinity. The building will be T-shaped, the cross representing the principal front; but this will only have an extra width of 13 ft. beyond the main body. The length from front to back will be 141 ft., the frontage width being 51 ft., and the remainder 38 ft. The principal entrance will be in the front of the building, on one side of which will be the matron's rooms, with bay-window (which is carried to the floor above), and on the other the men's sitting-room, 28 ft. by 17 ft. The bed-rooms for male patients will also be on the ground-floor, approached from a corridor. On the first floor are placed the bed-rooms for females, with a corridor as on the ground-floor. Their sitting-room will also be on this floor, and will occupy the front wing over the matron's rooms. On the opposite wing will be the general dining-room, 30 ft. square. In the attic-story rooms are obtained, which are lighted by dormer-windows, with a corridor giving access to them. All the bed-rooms are walled to the ceiling, each patient having a separate room, except in a few cases, where double-bedded rooms have been provided. All the rooms are fitted with fixed wash-basins, with water-pipes, &c. Accommodation will be afforded for sixty patients, besides the servants. Special attention has been paid to the heating and ventilation. The latter will be on the system adopted by Drs. Hayward and Drysdale, of Liverpool. It is self-acting. The vitiated air is carried from the ceiling of each room or corridor into a central flue, whence it is drawn off by the heat of the kitchen fires, and it then passes up the chimney-shaft. When in working order, the institution will not be a "charity," in the usual sense of the term. A fixed charge will be made for each patient, which, however, will be more than returned in attention and generous diet, and, it is hoped, in that restoration of health which is the chief desire of the generous donor.

A NEW THERMOMETER.

M. Palmieri, the director of the observatory on Vesuvius, has at present exhibiting at the Royal Academy of Sciences at Naples a new metal thermometer provided with alarm bells. The latter are sounded as soon as sudden changes of temperature take place. The apparatus is so sensitive that its hand is constantly in a state of oscillation. When the change of temperature has attained a certain height, the alarm signal sounds, thereby enabling the observer to notice the rise and fall of temperature. By means of a peculiar arrangement the highest and lowest grades of temperature prevailing at a certain time will be registered; and this is independent of the proper purpose of the instrument, viz., to indicate when certain limits are exceeded. The Professor had been commissioned by the Empress of Russia to construct such a thermometer; it will be hung up in the Imperia- travelling carriage, and by its help the tempera- ture may be regulated by heating or ventilation

THE ARCHITECTURAL ASSOCIATION.

The new session has commenced under the presidency of Mr. E. J. Tarver, and the opening *conversazione* has passed off successfully. Paintings, drawings, metal work, embroidery, carved woodwork, painted tiles, terra-cottas, and other objects of interest were lent for the occasion by various manufacturers, members, and their friends.

As usual, some of the prizes offered by and through the Association were formally presented by the president, the successful students receiving hearty applause as they came up to the chair. The following is a list of the awards:—

For the two best series of designs in the Class of Design:—1st, H. W. Pratt; 2nd, H. Avern. Honourably mentioned, T. Garratt.

For the best set of drawings in the Elementary Class of Design, to L. A. Shuffrey. Honourably mentioned, A. Ingleton.

For a design for a country mansion,—offered by the late Sir William Tite, C.B., M.P.,—to H. Avern. Honourably mentioned, H. G. McLachlan, H. Whipple.

For measured drawings from existing buildings in England previous to the eighteenth century, offered by the Architectural Union Company,—to W. Talbot Brown and to T. Garratt. Further prize offered by the Association, to E. Sugden.

For a descriptive account of the churches visited during the Newark and Lichfield excursion, offered by Mr. Edmund Sharpe,—to F. P. Johnson; &c.

A short address from the president formed part of the work of the evening. In this he alluded to the many opportunities for mutual study afforded by the Association, and to the friendships which should naturally be formed by young men constantly meeting and taking active interest in special pursuits. He thought in the main the best service afforded to members was in this mutual help and emulation; and that less stress should be laid on the professional interest of the members who will probably deal with such matters with more weight in after years. Still the presence of older men is welcome and called for,—who can and will give assistance in studies and otherwise. As a past president who has maintained for many years such a position, Mr. T. Roger Smith was called on, and made a few remarks on the architectural activity in the large commercial towns of the North of England,—for instance, Liverpool, Manchester, Preston, Halifax, Leeds, and others. There is to be found in the public and private buildings of these places,—which he had recently examined personally with much care, — a thoroughness in design, and execution too, rarely met with in London. Is the activity of thought and deed less in what was once the intellectual as well as political capital of England? Or are greater strides being taken elsewhere than here? As to architecture, the future answer to that question will no doubt be materially affected by the character of the studies and of the students in the classes of the Architectural Association.

The first ordinary meeting of the session was held on the 31st ult., the president in the chair.

The following gentlemen were elected members:—Messrs. C. J. Bentley, W. J. Wood, S. J. Lethbridge, J. G. Stevenson, R. W. Collier, J. Rowkwood, jun., W. J. Kemp, J. E. Sears, J. Gandy, R. R. St. Ledger Morrison, G. H. Jeffrey, W. F. Unsworth, C. J. Graham, W. S. Guildford, E. B. Lamb, &c.

The Secretary, Mr. Paice, read the report, which mentioned the increasing number of students joining, in order to take advantage of the many and still fresh opportunities for, and help towards, self-education. Careful arrangements have been made with respect to the work of the several branches of the Association. It is to be hoped that, with the fewest possible exceptions, each member will be able to interest himself thoroughly in the success of one, if not more, of these branches, giving in this and other ways, as may be in his power, hearty assistance towards the realisation of the objects for which the Association was originally formed, viz., the promotion of friendly intercourse among the younger members of the architectural profession, and of efficient study in fellowship of matters affecting their common pursuits. Contributions having been from time to time offered by members and others, a prize fund was established at the commencement of the session, to which the following gentlemen subscribed:—Professor T. Hayter Lewis, Mr. J. Douglass Mathews (ex-president), and Messrs. E. J. Tarver, T. H. Watson, R. Plumbe, J. S. Quilter, B. A. Paice, and S. E. Barnes. It was decided that three prizes, value five guineas each, should be awarded towards the expenses of members in their sketching tours. After a competition, in which work done previously was submitted, the prizes were given to E. J. May, R. C. Page, and T. C. Yates.

The Treasurer (Mr. J. Douglass Mathews) then read the balance-sheet for the past session, which showed that the total income was 439*l.* 10s. 3d., and the total expenditure was 435*l.* 1s. 8d., thus leaving a balance of 4*l.* 8s. 7d. in hand.

The secretaries of the various classes afterwards presented their reports. It was shown that in the Class of Design, although the attendance was not so numerous as could have been wished, some good designs were produced. The Class of Construction and Practice, in its reconstituted form, under experienced visitors, was very successful, both as to the numbers attending its meetings, and as to the work done. The architectural examination was held in May, when three candidates, all members of the Association, passed in the Class of Proficiency; two others, in one section only; and twelve (including several members) in the preliminary examination. The fact that those who passed were more numerous than in any previous year should afford encouragement to intending candidates. A contribution was made for the first time towards the funds of the Architects' Benevolent Society, consisting of small subscriptions of members, and a sum voted from the funds of the Association.

Mr. Walter Spiers, in answer to inquiry, said the value of the library was about 350*l.*

The Chairman, in the course of his remarks, said that if they confined themselves within the range of standard works in the profession, and did not attempt to act within these walls as practitioners, they would devote their powers to the proper object. Among the members were included many of the most successful architects of the day. The Association then numbered about 600. Of these eighty-eight joined last session; but he regretted to state that sixty-five of these new members had not contributed in any way to the common stock of knowledge, thus showing a want of appreciation of the objects of the Association. The Sketch Book numbered no fewer than 158 subscribers; out of these only thirty-three contributed sketches, thus leaving a tremendous amount of work to these contributors: and he urged upon the new members to work hard with them. Many leading men naturally expressed surprise at the leading copies of their work. It was the bane of the profession that there were so many imitators, so let them think for themselves.

On the motion of Mr. Ridge, seconded by Mr. Quilter, thanks were voted to the President, and the meeting then terminated.

LABOURERS' COTTAGES WITH THREE BEDROOMS.

Sir,—The difficulty of providing three bedrooms is met, on the plan of Sir W. Jones, by placing the third bedroom in a lean-to on the ground floor; and, on that of my friend Mr. T. Roger Smith, by "building an external shed, and carrying up the walls to the top of the cottage." Both expedients seem to me, not only objectionable, but quite unnecessary; indeed, I have not found it needful to depart from the traditional arrangement of an ordinary English house, in which the living-rooms and offices occupy the whole of the ground floor, and the bedrooms occupy the whole of the floor above them.

Thus, according to the received authorities, the minimum sizes for the three bedrooms are 100 + 80 + 70 = 250 ft., which, with a few feet for passage-way, will make say 265 ft. in all. The minimum sizes for the ground floor rooms are 150 + 70 = 220 ft., which leaves 45 ft. only as the excess in area of the bedroom floor over the ground floor. This is little enough for the pantry, which is a necessary adjunct, and the entrance lobby, which is most desirable. Every architect will work out the details in his own way: in practice the bedrooms are generally made somewhat larger than these minimum dimensions. I am now designing some cottages in which about 40 ft. are added to the bedrooms, and this is easily divided amongst the living rooms, pantry, and lobby.

A cottage built in perfect accordance with English traditions is usually occupied after the English fashion. When we find the third bedroom used as an apple store, we should consider how few pantries are large enough, or dry enough for the winter stock of garden produce, and we need not rush to the conclusion that there is indecent crowding in the other two rooms. If one of the ground-floor rooms is made into a parlour, is it not the special ambition of every housewife to have one room untrodden by working-day feet? A proprietor who, out of pure good nature, has made his cottages theoretically perfect, and finds that his labourers, after living in two rooms for many generations, do not all at once occupy five rooms just as he would wish, should have patience: in two or three generations more the parlour will become a dining-room, and a lean-to will be needed for the drawing-room or boudoir.

Thos. Blashill.

DEAR COALS AND DOMESTIC SAVINGS.

I have waited a long time to see in the *Builder* some practical suggestions for a general improvement in house (or room) warming *for the million*; the various plans put forth (as far as I recollect) being only adapted to houses of the higher class, and expensive; and I must express my ignorance at present as to what is being done at the Society of Arts in regard to the prizes offered. Lighting the fire in the common stove at the top, and putting a plate at the bottom, has not become popular, and never will. Gentlemen who pay 10*l.* for a new stove, &c., on that plan do not get a "cheerful fire," and grow tired of looking at it. A new grate at a cost of 15s. to 20s., to give more heat, is the desideratum, and could be managed by the manufacturers in the North, if they would give their attention to it. The long-standing wasteful defect is *bedding the ordinary stoves in brickwork*, and consequent loss of heat in the wall. The fireplace should be plastered clean all round, arched over, and the stove stand clear; the feet being set on brick and cement, about 6 in. deep, but a short connexion of iron or brick into the arch above; the front of the stove being perforated or trellis-pattern, to let out the heat: and for the modern "breakfast-parlour," or other rooms below, a great improvement would be the insertion of pipes from underneath the floor to the side of the fireplace, bringing a stream of fresh air to impinge against the cheeks, and these should be of fire-brick, fitted on an improved plan. This ventilation would, of course, save much rotting of floor, and increase the draught when doors, &c., are closed up.

For small rooms, lodgers, &c., especially where the chimneys smoke the wrong way, a little grate might be made (as some are now) only the width of the fire, but with a hot hob or shelf at each side *cast in a piece with the fire-grating*. These should stand flush with the chimney-piece, and having a neck slightly sloping back into the flue, when they would no doubt draw well.

Corrigenda.

THREATENED COLLAPSE OF THE NEWINGTON-BUTTS IMPROVEMENTS.

An Act of Parliament was obtained last year by the Metropolitan Board of Works for making a very important improvement at Newington-butts by materially widening the thoroughfare. The project involves the taking down of the present parish church (which projects in an unsightly manner into the highway), and building a new parish church on another site which has already been secured; but although the plans of the new church have for some time been in readiness, the building of the structure has been delayed, owing to a certain amount of money not being forthcoming; and, from the proceedings which took place at a protracted meeting of the Newington Vestry, last week, it now appears that the entire scheme is not unlikely to end in failure, and the abandonment of the improvement, which is one of great importance, and much to be desired.*

The question of this improvement has already been referred to in the *Builder*, in connexion with the proposed new parish church, and also a second new mission church, now in course of erection in Newington Churchyard. The discussion of the subject at the meeting of the Newington Vestry last week was the result of a resolution of the Church Building Society forwarded to the vestry, stating that the committee saw little probability of the requisite sum being raised within the time specified by the Act of

* But, beyond this, the threatened failure of the scheme is a matter of considerable gravity to owners of property in the locality, as several blocks of houses have changed hands on the faith of the improvement being carried out.

Parliament, and the discussion of the meeting turned upon whether the vestry ought not to find the money, seeing that the removal of the church was to benefit the parish by widening the thoroughfare. The rector of the parish, who presided, appeared to be of opinion that the money ought to be found by the ratepayers; whilst, on the other hand, it was contended that this would be an injustice, if not illegal, one of the speakers observing that the ratepayers, through the Metropolitan Board, had already agreed to contribute 4,500*l.* for the old church and the site. Ultimately it was resolved,—"That the vestry memorialise the Board of Works to petition Parliament to repeal so much of the Metropolitan Streets Improvement Bill as related to the deposit of the sum of 5,000*l.* in the hands of the Ecclesiastical Commissioners, and for power to constitute the new church now in course of erection the parish church for the time being." The rector observed that he could only say that if they went to Parliament, he should oppose them there; and as to the mission-church, he hoped to show them it was needed.

It is thus not improbable, from the resolution adopted by the vestry, that there will be another Parliamentary fight in connexion with this long-talked-of improvement, and that, in the meantime, the improvement itself is jeopardised.

A LABOUR QUESTION.

Is it true that there was a strike in the stone-quarries at any time during 1873? A contractor has stated that between the months of January and July, 1873, there was a strike among stone-quarrymen, which has had the effect of raising the price of stone. Is this statement correct?

A. B.

LUDGATE-HILL.

Chaos just now reigns supreme in Ludgate-hill. This thoroughfare, at the best of times, is not very easy to pass through, being so crowded; but now that the pavement is taken up, and other works are being carried on which tend to block up the space intended for foot-passengers, the state of affairs is really becoming serious. The street is being paved with the wood pavement under the auspices of the Improved Wood Paving Co., and the smell of tar is just now very powerful in Ludgate-hill. Passers-by appear to be much interested in the process of laying the wood pavement, and as this leads them to congregate, the attendant policemen have no little difficulty in keeping the road clear. At the lower end of Ludgate-hill, towards the station, building operations are going on, and have been going on,—well, if not quite since the memory of man, certainly for a considerable period. When these buildings will be completed, and the thoroughfare in its ordinary state again, of course we cannot say, but the improved wood pavement, as well as the other improvements, ought certainly to prove very beneficial in order to recompense the public for present discomfort in Ludgate-hill.

DRAINAGE AND SEWAGE WORKS.

Twickenham.—The plans for the drainage of this parish, prepared by Mr. H. Malcolm Ramsay, the town surveyor, having been finally approved and adopted, have been submitted to the Local Government Board for their sanction to borrow the necessary funds (20,000*l.*) to carry out the works. The system advised by Mr. Ramsay for disposal of the sewage, is that of intermittent downward filtration, as also advised by him in his scheme submitted to the Richmond vestry. Mr. Ramsay is of opinion, as explained in his report, that ultimately a market will be found for the sale of the sewage in the surrounding agricultural districts, and that, therefore, it would be unwise for the local authority to adopt irrigation, and thereby incur the costly alternative involved in the purchase of a large tract of land.

Richmond.—A special general meeting of the Richmond Select Vestry rescinded a resolution passed at a former meeting, for the adjournment of the drainage question for three months, and to consider farther the scheme sent in by "Experience" (Messrs. Russ & Minns's), and if approved, to adopt it. The meeting was a very full one, there being twenty-six members present. The chair was occupied by Admiral Stopford, J.P. After a somewhat stormy discussion the resolution was carried by fourteen against twelve. It was subsequently resolved, by thirteen against eleven, "That the scheme of 'Experience' be now considered," and ultimately, by a majority of eleven to six, "That after the long and careful consideration of that scheme, and after the final satisfactory answers that have been made by the engineers, the vestry do fully approve the said tunnel scheme." This was the signal for some tumult, during which Mr. Sims gave notice to convene a meeting to rescind the resolution then carried. This meeting has since been held, and has affirmed, by 13 to 12, the resolution previously passed to adopt the tunnel scheme; and resolved that the scheme be referred to Mr. Abernethy, C.E., with a request that he will advise the vestry as to its suitability and effectiveness, and the estimates and engineering details, and generally on the subject of the disposal of the sewage of the parish. —— We omitted to mention in our account of the different schemes that the author of the scheme "Practice," left in finally to compete with "Experience," is Mr. H. Malcolm Ramsay, surveyor to the Twickenham Local Board.

UTILISATION OF SLAG.

SOCIETY OF ENGINEERS.

At a meeting of this Society, held on Monday last, a paper was read "On the Economic Uses of Blast-furnace Slag," by Mr. Perry F. Nursey.

The machinery of Mr. C. Wood, of Middlesbrough, and of Messrs. Bodmer, of Hammersmith, was described by the author, with the aid of diagrams. Mr. Wood's machines, he said, were of two kinds, one a horizontal revolving table, and the other a vertical revolving drum. By the first machine the slag was cooled as it left the furnace under a stream of water, and becoming disintegrated, was broken up and pushed off the table at a certain point, by scrapers, into trucks placed beneath. In this state the material is in a fit condition for making concrete for buildings. The second machine is for reducing the slag to a finer condition. It is run from the furnace into the drum, through which a stream of water flows. The drum has screens placed within it, and as it revolves the slag becomes reduced to a fine sand, and it is delivered in that condition into trucks. This sand is utilised in making bricks, cement, mortar, and for other similar purposes. Messrs. Bodmer's plan consists in the use of a pair of rolls, through which the slag is run from the furnace into a travelling band, which delivers it where required. The sheet of slag thus produced is readily broken up for use in making concrete, or ground into powder for bricks, cement, or mortar. For some purposes Messrs. Bodmer run the slag into water; but for bricks and cement they produce it dry. They have also a special system of machinery for the manufacture of slag bricks, which is worked by hydraulic power.

SCHOOLS OF SCIENCE AND ART.

Wolverton Science and Art Institute.—The anniversary of the opening of the science and art classes in connexion with this Institute has been celebrated by a *soirée*. The proceedings commenced with tea, of which upwards of 600 persons partook. The room was decorated for the occasion. After tea the large company adjourned to the Institute, where the prizes were announced to be distributed to the successful students during the past year. Mr. Thomas Brassey, M.P. for Hastings, and a director of the London and North-Western Railway, presided and presented the prizes. The room, although large, was densely packed with people. Mr. R. King (secretary to the Institute) gave some information respecting the present position of the Institute. There had been an encouraging increase in the number and success of those who had availed themselves of the advantages of the institution. At its opening in 1864 the number of members was 244, and of science subjects only three or four were taught, and only about 20 students attended. Since then the number of members had been raised to 450, and the number of students in science and art subjects had increased to 152. For the most part the science teachers conducting the classes had been men employed in the works, who, having worked themselves up in certain subjects, had by competitive examinations obtained teachers' certificates from the Science and Art Department, South Kensington. The committee has thus been enabled to arrange for instruction in many subjects without incurring great expense in teachers' salaries. The teachers were Messrs. Coker, A. Goyer, G. Green, and T. Moore (art teacher). After giving the number of students who had passed in the different subjects, the secretary stated that the following honours had also been gained by Wolverton students:—

"In 1872 E. G. Field obtained a Whitworth scholarship of 100*l.* per annum for three years, and W. H. Warren gained one of the bronze medals given by the Department for excellence in mathematics, and also a Royal Exhibition of 50*l.*, with free education for one year at the Royal College of Science, Dublin; and in 1873 W. H. Warren obtained a Whitworth Scholarship, and also a certificate with prize of 10*l.* given to the best student in honours at the Society of Arts Technological examination in the manufacture of steel, coupled with an offer of a studentship of 50*l.* by Her Majesty's Commissioners of the Exhibition of 1851. Both young men are now studying at Owen's College, Manchester."

RE-OPENING OF THE BURY ATHENÆUM.

The large hall of the Bury Athenæum, after being closed for many months, has again been opened to the public. The building was erected in 1851, under the superintendence of the late Sir Robert Smirke, R.A. During the past few years the directors have had on several occasions to repair the timbers of the roof. In the autumn of last year appearances were so threatening that they gave instructions to Messrs. Maxwell & Tuke to make a thorough investigation of the state of the roof, and to report upon it. These gentlemen, in their report, stated that the timbers were far too slight for their work, and were in many places absolutely crushed by the load they had to carry, and insisted upon the necessity of new and much more substantial framing. This report being adopted, the architects were authorised to prepare plans and get the works executed. These have now been completed, with the exception of a little painting and decoration still remaining unfinished. The replacement of a new and substantial roof for the old shaky construction necessitated an entirely new ceiling for the large room, and a curved and panelled ornamental ceiling now replaces the old and comparatively plain one. Three large sunlights have been placed in the ceiling. The platform has been raised 1 ft., and a performers' room conveniently placed underneath, with stairs both on to the platform and into the room. Various other improvements have been made. The plastering and painting have been executed by Messrs. Jacob Lomax & Sons; the joiners' work is by Mr. Waddington; the stonework, by Mr. James Hill; and the plumbing and gasfitting are by Mr. R. Caton.

OPENING OF A NEW RESERVOIR AT OSWESTRY.

The ceremony of turning on the water into the new reservoir has been performed by the Mayor of Oswestry. There was a large number of ratepayers and others present on the occasion.

The new reservoir has been executed by Mr. John Whittington, under the gratuitous inspection of Mr. George Owen, C.E., and Mr. W. H. Spaull, and has cost the ratepayers nearly 4,000*l.*, including the cost of the land. There has been a shortness of water supply in the three dry summers since the two first reservoirs were completed.

The present reservoir was "trigged" out by the surveyor, Mr. E. B. Smith, and his assistants, on the 5th of January, 1870. The work was completed in about fifteen months, and the formal opening took place on the 11th of May, 1871. The cost of the reservoir to that time was about 2,000*l.* The site of the reservoirs had been for a century past used as brickyards, and to convey the water where it was required for brickmaking had caused the surrounding land to be "honeycombed" with drains. These were not discovered at first to the extent they existed, and consequently in a short time afterwards the south-western and north-western banks gave way, and gradually fell down into the middle of the reservoir. It was allowed to remain in that state until the spring of 1873, when Mr. Ward undertook to trace the drains to their source, put down a deep puddle wall, remake the banks, and line the sides of it with a large wall of stone, filled in with hydraulic lime, and concrete the bottom, for 1,350*l.* A considerable sum of money additional has been expended to make walks around it, trim the

slopes occasioned by the deposit of the excavations, and other matters, all of which has been accomplished.

The depth of the reservoir from the water-line downwards is 21 ft., and 3 ft. from the water-line to the surface, making a total depth of 24 ft. The quantity of clay excavated, at first, was 43,000 cube yards. Such was the density of the clay, that it weighed 140 lb. to the cube foot, and great quantities of it had to be "blasted" with gunpowder.

The present consumption of water by the town is about 150,000 gallons per day; and the three reservoirs will contain over 9,000,000 gallons; so that, when once filled, they will contain sixty days' supply. The main pipes, however, are in a corroded state, and the council have it under consideration to get them scraped.

REREDOS, PLYMOUTH.

The chancel of the Catholic Apostolic Church has recently been enriched by the erection of a reredos, or altar-screen, executed in carved oak, by Mr. J. T. Legassick, from a design by Mr. H. Elliott, architect, of Plymouth. It extends across the whole of the chancel end, and consists of canopied arches and niches of light open work, ornamented with tracery, pinnacles, crockets, and other enrichments, the wall at the back being lined with oak panelling, except certain spaces which will ultimately be filled in with decoration in colour. It is intended to refit the sides of the chancel with carved oak stalls and panelling to harmonise in general character with the work above named.

The roof and upper portions of the walls of the chancel have already been finished in colour and gilding.

CAUTION TO BUILDERS.

The committee of works of the vestry of St. George, Hanover-square, have instructed Mr. Tomkins, surveyor to the board, to summon all builders who stack bricks and other materials outside hoardings where new work or repairs are being done.

Mr. A. Scott, builder, of 48, South Molton-street, Grosvenor-square, is the first to feel the effect of this order by being fined, by the magistrate at Marlborough police-court, the sum of 40s. and costs, for piling up a stack of bricks outside the hoarding of a job Mr. Scott has on hand in Albemarle-street.

As no notice is given either by the police or the vestry preparatory to a summons, builders having work in St. George's had better take a note of this paragraph.

DWELLINGS OF THE METROPOLITAN POOR.

The report of the Special Committee of the Charity Organisation Society on the Dwellings of the Poor was presented at the weekly meeting of the council, on Monday. It was signed by Lord Napier and Ettrick, and is a careful statement, with notes and appendices. The concluding and principal recommendation is that,—

"extensive and effectual powers of purchase, demolition, and direct or delegated reconstruction, should be vested in the chief existing municipal authorities of London—the Corporation and the Metropolitan Board of Works,—in order that they may follow the example set by the municipalities of Glasgow, Edinburgh, and other provincial cities which have been armed by Local Acts with such prerogatives; and that the Corporation and Metropolitan Board should be urged to use those powers, when obtained, in a bold and comprehensive manner, but with special regard to the interests of the poorer members of the community."

PREMIUMS AWARDED TO ENGINEERS.

The Council of the Institution of Civil Engineers have awarded the following premiums:—

*1. A Watt Medal, and a Telford Premium, in books, to Sir Charles A. Hartley, for his paper on "The Delta of the Danube, and the Provisional Works executed at the Sulina Mouth."

2. A Telford Medal, and a Telford Premium, in books, to James Deas, for his memoir on "The River Clyde."

3. A Watt Medal, and a Telford Premium, in books, to John Head, for his paper on "The Rise and Progress of Steam Locomotion on Common Roads."

4. A Watt Medal, and a Telford Premium, in books, to William Anderson, for his description of "The Aba-el-Wakf Sugar Factory, Upper Egypt."

5. A Telford Medal, and a Telford Premium, in books, to William Thomas Thornton, C.B., for his essay on "The Relative Advantages of the 5 ft. 6 in. Gauge, and of the Metre Gauge for the State Railways of India."

6. A Telford Medal, and a Telford Premium, in books, to Colonel William Henry Greathed, C.B., R.E., for his "Account of the Practice and Results of Irrigation in Northern India."

7. A Telford Premium, in books, to John Milroy, for his paper on "Cylindrical or Columnar Foundations in Concrete, Brickwork, and Stonework."

*8. A Telford Premium, in books, to William Pole, LL.D., for his "Notes on the Rigi Railway."

*9. The Manby Premium, in books, to Thomas Sopwith, jun., for his paper on "The Mont Cenis Tunnel."

The Council have issued a list of subjects on which they invite communications of a complete and comprehensive kind in competition for premiums. A copy of it can doubtless be obtained at the Institution by persons who are interested.

The opening meeting will be held on the 11th inst.

SCHOOL BOARD SCHOOLS.

Fulham.—The schools built at the instance of the London School Board, called the Harwood-road schools, situated at the corner of Parsons-green, Fulham, have been formally opened.

Leicester.—The Leicester Schools Committee, at their meeting on the 23rd ult., decided to erect a new Board school in Belgrave-road, at a cost of 6,000*l.*, the plans for which have been prepared by Messrs. Millican & Smith, architects.

ACCIDENTS.

Fatal Fall from a Scaffold at Reading.—An inquest has been held on the body of Henry John Baylis, a lad seventeen years of age, who died from injuries received in falling from a scaffold. George Russell, a labourer in the employ of Mr. Knowles, builder, said that he was at work with deceased at a building at Binsey. Deceased was going up a ladder with a hod of bricks on his left shoulder, and while stepping on the landing about 16 ft. high, the handle of the hod caught the scaffold and he fell to the ground, the bricks in the hod falling on his shoulder and collar-bone. Mr. Palmer, house surgeon of the Radcliffe Infirmary, said deceased was badly injured in the spine, and paralysed in both legs. A verdict of "Accidental death" was returned.

Carelessness with Blasting Powder at Trimdon Grange.—Two children were allowed to play with a pit flask near a quarter barrel of blasting powder and exploded the whole, killing one of the children and destroying two houses built back to back.

THE INTERNATIONAL METRE.

According to *Les Mondes*, the first International metre measure was cast, in the presence of the commission now sitting at Paris, in the laboratory of M. Sainte-Claire Deville, who has been able, with the assistance of M. Debray, to alloy platinum and iridium in their pure chemical state. The *modus operandi* is to serve as a guidance in the production of all future original metres. The operation was considered of such importance that the President of the French Republic and several high dignitaries of State were present during the proceedings. Nine kilogrammes of platinum and one kilogramme of iridium were melted by means of the oxy-hydrogen gas blow-pipe. This process took three-quarters of an hour; the molten mass was then let off into a mould made, like the crucible, from a block of limestone, whose inner surface was burnt to lime in consequence of the enormous heat. In applying this substance, there is consequently no danger of a fracture in the mould. The metal did not lose its lustre in cooling. The casting, which was considered a perfect success by all present, will have to be submitted to all the processes necessary for converting it to its eventual use.

CHURCH-BUILDING NEWS.

Bathwick.—The foundation-stone of the long-talked of chancel of St. Mary's, Bathwick, has been laid by the Rev. Prebendary Scarth, rector of Wrington, who originated the idea of making this desirable addition to the church, including, as it does, a vestry and organ-chamber, during his incumbency of the parish. The cost of the work will be not less, probably more, than 3,000*l.*; of which, we believe, about two-thirds has been paid or promised.

Bradford.—The new church which has been erected in Little Horton-lane, Bradford, and which is dedicated to St. John, has been consecrated for divine service by the Bishop of Ripon. Consisting of nave, with north and south aisles and chancel, the edifice will afford accommodation for 700 persons. The style of architecture is Early Decorated Gothic of English character. A tower 23 ft. square at its base rises from the western half of the chancel, and is carried on arches on the four sides. It is surmounted by a belfry constructed for a peal of eight bells. The total height of the top of the vane is 115 ft. The architects are Messrs. T. H. & F. Healey, and the contractors for mason and joiner work Messrs. J. & W. Beanland. The cost of the building, including the site and extras, has been about 11,000*l.*, and of this amount between 9,000*l.* and 10,000*l.* have been raised, leaving a balance of about 1,500*l.* still to be made good.

Manningham (Bradford).—The chief stone of St. Mark's Church, Manningham, has been laid by Mr. F. S. Powell, M.P., in the presence of a large assemblage. The building, which is well advanced, is situate in Grosvenor-road, Manningham; is in the Early Decorated Gothic style, 150 ft. long by 72 ft. wide; and consists of nave, side aisles, baptistery, and narthex, and will have a tower and spirelet, rising to a height of 150 ft. The internal height is 65 ft. Accommodation will be found for 1,000 persons. The nave and aisles only are to be erected at present. Inclusive of land, the portion proposed to be erected will cost 8,000*l.*, but it will take upwards of 10,000*l.* to complete the building. The amount received and promised is 5,300*l.*

Toseland.—The church has been re-opened and consecrated. The architect, Mr. T. Streatfield, has endeavoured to restore the church as nearly as possible to its original state; and his plans have been worked out by Mr. Osborn, St. Neot's, and Mr. Wade, Eaton Ford.

Frankley.—The little church of this parish has been re-opened, after a restoration, which has been carried out from the designs of Mr. F. Preedy, of London, by Messrs. Collins & Cullis, of Tewkesbury, at a cost of 1,100*l.* Of this amount 950*l.* have already been raised, to which Lord Lyttelton, who is the principal owner of the soil, contributed 500*l.* The restoration comprises the putting in of new foundations to all the walls, the rebuilding of the south chancel-wall, the erection of a new south porch, the replacing and fitting of the roof, and the insertion of several new windows in the church. Inside the walls have been relieved of the plaster, and a new chancel-arch erected. The roof timbers have been thrown open, and the church seated with new open benches. A new arch has been opened at the west end, and the font has been placed under the tower.

Dorking.—At a recent meeting of the parish church building committee, it was resolved to proceed with the erection of the Wilberforce Memorial Tower a further height of about 20 ft., making nearly 60 ft. in all, and carrying it to the apex of the nave roof. It was also resolved to instruct the architect (Mr. Woodyear) to make provision for the church-clock in the portion of the tower now about to be undertaken. The late fine weather has enabled the contractors to make considerable progress with the works generally. It is hoped that in about a month or five weeks the nave roof may be on and partly completed.

Shipston-on-Stour.—A new church has been consecrated at Darlingscott, in the parish of Treddington. The edifice, which is but a small one, is erected on a site presented by Sir G. B. Phillips, bart., who was also a subscriber to the building fund to the extent of 200*l.* The style of the church is English Gothic, built of white Armscot lias, with Bath stone facings. The interior has no pretence to decoration. It is capable of accommodating about 200 persons. The south transept is so constructed as to be appropriated on week-days to the purposes of a national school, being partitioned off from the nave of the church by a movable screen. The want of a church and school has long been experienced in the village, as the mother church and national schools are situated in the parish of Treddington, some two miles distant.

Parwich.—The new parish church of St. Peter, Parwich, built at the sole cost of Mr. T. W. Evans, of Allestree Hall, patron of the living, has been opened by the Bishop of Lichfield. The new edifice has been built from designs by Mr. F. J. Robinson, of Derby, architect. The style adopted is late Norman, the chancel being rather later, and bordering upon Early English. In plan the church consists of a

* Have previously received Telford Medals.

chancel 16 ft. by 22 ft. 6 in. in the clear; the nave and north and south aisles are 47 ft. by 41 ft. in the clear. There is a western tower and spire, which rises to the altitude of about 100 ft.; and there is an organ-chamber and vestry, 18 ft. by 12 ft. at the east end. The pulpit, which is of worked stone, occupies the east end of the northern arcade, and the old Norman font has been replaced at the south-west end of the nave near to the tower. There is a new reredos, of Ancaster stone; this is carved, and has upon it, immediately over the altar-table, two seraphim with veiled faces. These stand upon pedestals. The panels on either side of the central cross are carved with foliage suggestive of the Sacrament. The extreme length of the building, from out to out, is 96 ft., and the extreme width, 51 ft. The nave is separated from each aisle by arcading of four bays, each column being surmounted by carved capitals. Two of the responds are old examples, and the types of these, as well as of other local Norman work, have been retained by the carvers. The aisles are lighted on either side by circular-headed single-light windows, and by double-lighted ones on their western ends. The clearstory is lighted on each side by nine cinquefoil circular windows, recessed in a running arcade. The walls all through the interior of the church are of ashlar stone, and the roofs of the nave and chancel and the lean-to roofs of the aisles are of timber. The seating is open, and of pine; the stalls in the chancel are of pitch pine. The ancient chancel arch in the old church has been preserved, and made to form the tower arch. The church is entered by a western tower door, and a priest's door. Over the former is the Early Norman arch that originally belonged to the south door, and within it is a tympanum, sculptured in Norman type. The roofs are slated, but the spire, which is low and squat, like nearly all the local spires, is entirely of stone. The carving throughout the building has been executed by Mr. Harry Hems, of Exeter, sculptor. The builders are Messrs. H. & J. Slater, of Derby; and the Coxbench stone, produced from a quarry belonging to these contractors, has been used for all the work.

Portmadoc.—The foundation-stone of a church, dedicated to St. John the Evangelist, has been laid here. The church will consist of a nave 64 ft. by 25 ft. 6 in., north and south aisles each 65 ft. 6 in. by 10 ft.; chancel, 31 ft. by 21 ft.; with organ-chamber and vestry on the south side, heating-room below, and an entrance porch at the north-west corner. Owing to the want of funds, the chancel and chancel aisle will for the present be omitted, as well as a tower contemplated for a subsequent date to complete the design. The church is arranged to accommodate 400 persons, and the present contract amounts to about 2,700*l.*, towards which about 2,050*l.* have been already subscribed.

DISSENTING CHURCH-BUILDING NEWS.

Manchester.—The corner stone of a new Presbyterian church, situate in Singleton-road, Higher Broughton, has been laid by the Hon. George H. Stuart, of Philadelphia. The site of the church is on the south side of Singleton-road, about half-way between Broughton Bar and Park-lane. Mr. John Stuart, brother of the Hon. George H. Stuart, has expressed his willingness to defray the entire cost of the erection. The church and schools, the foundation for which is already completed, will consist of nave, 74 ft. 4 in. long by 29 ft. 4 in. wide, with aisles on either side, 8 ft. wide, and transepts 20 ft. 4 in. wide (the latter containing galleries for school children), at the south end of the church, right and left of the pulpit platform. The style of the architecture is Early French Gothic. The exterior of the edifice will be executed in Pierrepont stone, with cut stone dressings. A lofty tower and spire (the latter ornamented by angle pinnacles and lucarnes), will rise from the west or right-hand side of the front elevation; and on the opposite side of the same front there will be a lower tower, surmounted by a pyramid of slate roof terminating in a metal finial. Each of these side towers will serve as an entrance porch, and will be gained by arched and moulded doorways. An arcaded corridor stretching across the whole front of the nave will join the two entrance porches, and from this corridor access will be obtained into the two main aisles or passage-ways between the seats of the church. The side walls of the church will be divided into four bays, in addition to the transept gables. Those to the aisles will contain a two-light window, with large traceried circle in the head of each, the whole being contained within a pointed arch. The clearstory will have coupled circles, with sexfoil tracery. The front gable over the arcaded corridor between the main entrances, will be enriched by a large wheel-window under a spacious pointed arch. The transept gables will have circular rose windows, with four small lancet lights below. The seats and timbers throughout are to be of pitch pine. On each side of the steps leading to the pulpit will be an arched and traceried door opening from the church into the long corridor of the school buildings. On the ground-floor of these back buildings will be placed the sessions-room, the minister's and the deacons' vestries, and the caretaker's residence. From this back corridor will rise two staircases, of ornamental design, in pitch pine, to the large lecture-hall, 56 ft. 3 in. by 25 ft., which will extend the whole length of the rear building, and which will have an open timbered roof. An opening will be left in the wall between the organ recess in the church and the lecture-hall, and will be provided with movable shutters, in order that the organ may be available for the lecture-hall as well as the church. Messrs. Price & Linklater, of Manchester and London, are the architects; and Messrs. Neill & Son, the contractors. The total cost of the building will be about 7,000*l.* The church is to accommodate over 700 adults, and the lecture-hall about 300.

Chester.—The new Wesleyan Methodist Chapel, on the City-road, which is to supersede the Home Mission Chapel in Black Diamond-street, has been opened for divine worship. The style is Gothic, and the materials used in the erection are Runcorn and Handbridge red sandstone. The front elevation is to the City-road, and presents a gable, with two entrances,—a smaller gable on the one side, and a tower, with broach spire, on the other, being used for access to the body of the chapel and galleries, as well as for descending to the school-room below. According to the designs of the architect (Mr. Botterill, of Hull), the spire was to be 118 ft. high from the City-road level, but the cost was considerable, and it was at one time decided not to erect a spire, and to finish it off just above where the buttresses now terminate. But the building fund was augmented beyond expectation, and the result was that the spire has been added, though somewhat reduced in height. In the centre of the principal gable is a group of three two-light windows, which, with respect to the interior is in the west gallery; and to avoid hiding this, the organ was divided,—one portion being placed on the one side of a recessed arch, the pedals communicating with the other portion on the opposite side. Below this large window is a three-light window, or group of three lights, and on each side of the building are rows of two-light windows, with alternate quatrefoil and sexafoil traceried heads. All the windows are glazed with an obscured glass, with ruby-tinted border. The chapel, which will accommodate nearly 800 persons, is 68 ft. long by 47 ft. wide, and the height from the floor to the ceiling, at the collar-beam, is 46 ft. There are galleries on three sides, with a communication by means of a narrow balcony across the chapel, at the east end. The whole of the interior fittings, with open roof-timbers, are of red fir, stained and varnished. Below the chapel there are a school and class-rooms, which are entered from Leadworks-lane. The principal school-room is 50 ft. by 46 ft., and 13½ ft. in height, and there are two class-rooms 16 ft. by 13 ft. each, and one 17 ft. by 12 ft., with room for heating-apparatus and other convenient and requisite appurtenances. Mr. Stringer, of Sandbach, contracted to build the chapel for 4,445*l.*, but that did not include the spire, which together with the site, gives a total cost of 6,500*l.*

The New County Police Station, Shipston-on-Stour.—The station now in course of erection will be built with brick and Bath-stone facings, and will consist of entrance-hall, court-room (34 ft. 6 in. by 16 ft. 6 in.), superintendent's parlour, and magistrates' retiring-room; there will also be a kitchen, scullery, pantry, laundry, and offices, and four bedrooms; prisoners' yard, four cells, stabling, and coach-house. The architects are Messrs. Medilam & Son, Gloucester, and the contractor Mr. John King, builder, of Shipston. The amount of the contract is 1,610*l.*

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Chester.—The first stone of a new Roman Catholic Church in the city of Chester has been laid. The site of the new building is very close to the park. The new church is to be dedicated to St. Werburgh. The designs of the architect, Mr. Edmund Kirby, of Liverpool, show a building of an Early English character. All superfluous ornamentation will be dispensed with, as the intention of the founders is to make the building as spacious as possible, regard being had at the same time to dignity of style. It will be composed of a chancel, where the high altar will stand, and will terminate with an apse of seven sides, to which will be attached side chapels, sacristies, and cloisters; a nave of six bays or sets of arches, with north and south aisles, and a tower, which, when completed, will reach a height of 200 ft., and will thus rival the highest towers and spires in the city. The exigencies of the site have altered the customary positions of the chancel and tower. The former will be at the west end instead of the east, and the latter will be in the place that should be appropriated to the former. The roof, the height of which will be 72 ft., will extend from the apse throughout the nave. The width of the building will be about 30 ft., and the entire length 140 ft., divided thus:—Chancel, 30 ft.; nave, 80 ft.; and base of the tower, 30 ft. Stourton stone is the material to be used in the construction of the church by the contractor, Mr. Thos. Hughes, of Aldford. At present only the chancel, side chapels, and cloisters, with four bays of the nave, will be built, the cost being estimated at upwards of 6,000*l.* The remaining portion of the design, which includes a presbytery or priests' house, will be built afterwards.

Workington.—The new Church of Our Lady and St. Michael, at Workington, is to be a cruciform structure, from a design by Mr. Edward Welby Pugin, architect, and in the Early English style. The entrance will be surmounted by a bell turret 90 ft. high from the ground. Beneath the turret there is to be a carving in stone representing the crucifixion, and underneath this two pointed windows. The building, which will consist of two aisles, a nave, a chancel, north and south transepts, a corridor, a sacristy, two confessionals, two chapels, and an altar, is to be 159 ft. in length, by 63 ft. in breadth; the breadth across the transepts being 63 ft. There will be an organ gallery arched over, and the pillars which support the nave roof are to be of polished granite with marble bases, the lower and upper portions being of red sandstone. The chancel, which is to be arched, will contain niches for figures. There is to be a large pointed window at the east end with five lights. The seats are to be made of pitch pine, and open. The church is be built of Lazonby stone, and for ashlar or tracery work stone from the St. Bees and Aspatria quarries is to be used. The structure, when completed, will accommodate 800 persons, and its cost will be 8,400*l.* Mr. Hugh Yates, of Liverpool, is the contractor for the whole of the work, and under the superintendence of his manager, Mr. Seagar, considerable progress has already been made with it.

SCHOOL-BUILDING NEWS.

Hill Top.—The four memorial-stones of a new schoolroom in connexion with the Wesleyan Schools, Hill Top, have been laid. The building, which will accommodate about 200 persons, is estimated to cost about 1,000*l.* Purses were laid upon the stones, which, together with various donations, realised a considerable sum.

Pickering.—The foundation-stone of a new school has been laid at Cropton. The school is to be ready for use by Christmas.

Worthing.—The new schools at Broadwater have been opened. The "mixed school" is nearly 50 ft. by 18 ft., and a teacher's residence will, it is hoped, soon be added. The architects were Mr. E. E. Scott, and Mr. Hyde, of Broadwater; and the builder, Mr. W. Softly, of Worthing.

Burrough-on-the-Hill. — The new parochial school, which has been recently erected on a site given by the rector at the east end of the village, was opened a few days ago, on the occasion of the harvest thanksgiving. The building is of brick, with white stone dressings, and has a bell-turret in stone in the east gable. The walls, internally, are lined with pressed

bricks, and the roof is open-timbered, stained and varnished. A porch at the west end answers the purpose of a cloak-room. The works have been executed by Mr. Hayes, of Melton Mowbray, builder, from the designs of Mr. R. W. Johnson, of Melton Mowbray, architect.

Ockley.—Mr. W. J. Evelyn, of Wotton, granted a site for the new schools at Wallis Wood, near Oakwood, and contributed 500*l.* towards the building expenses. Messrs. Colls & Sons, builders and decorators, of Dorking and London, furnished plans and specifications for the school buildings, to accommodate 120 children, and for an adjacent residence for the master. The work was undertaken by Messrs. Colls, and the total cost has been about 1,400*l.* The formal opening of the schools has taken place.

Wilberfoss.—The new village school has been opened. The Rev. Nicholas Walton, with the principal landowner (Lord Leconfield), and the tenant farmers and tradesmen, formed a committee, and all subscribed liberally towards so desirable an object. The school has a master's residence attached to it. It has been erected from designs prepared by Mr. Whitaker, of Manchester (formerly of Wilberfoss); and the contractor for the works was Mr. Richard Horner, builder, Bishopthorpe. It is proposed to erect fence walls round the school grounds, which (with other minor matters required) will bring the cost up to nearly 1,000*l.*

STAINED GLASS.

India.—Messrs. Heaton, Butler, & Bayne have produced some rich heraldic windows for the Indian Government. They are intended for the New University Senate Hall, Bombay.

Cholesbury Church, Bucks.—The east window of this church has recently been filled with stained glass from the works of Mr. Pepper, in the Euston-road. It is of three lights, and illustrates the Nativity, Crucifixion, and Ascension of our Lord.

Beckenham Church, Kent.—One of the windows on the south side of the old parish church has been filled with stained glass by Alderman Wilson. It is designed in the Late Decorated style, and consists of two openings, containing respectively subjects representing the Resurrection and Ascension of our Lord, placed upon blue diapered backgrounds, having draped figures in the foreground. These are surmounted by architectural canopies, based upon ornamental pedestals, and surrounded by suitable borders in the style of the period. The glass is in memory of "Jeremiah Wilson." The whole is designed and executed by Mr. Charles A. Gibbs, of Marylebone. In the same church is placed a two-light window on the north side of the clearstory, the subject being the Return of the Prodigal Son. The figures are placed under canopies, with borders and pedestals of the Perpendicular style. The treatment of the subjects is in keeping with the style. This window was presented by Mr. Charles Lee-Wilson, of Beckenham, son of Alderman Wilson, and was designed and executed also by Mr. Charles A. Gibbs.

Todmorden Church.—Three clearstory stained windows have been recently placed by Messrs. Cox & Sons, of Southampton-street, Strand, in this church, the windows consisting of two lights and a sexfoil, opening in tracery respectively. Six of the eight beatitudes enunciated in the sermon on the Mount (Matt. v.) have been selected to be represented therein:—"Blessed are the poor in spirit," &c., by the Angel of the Lord appearing to the shepherds at Bethlehem; "Blessed are the meek," &c., by Joseph manifesting himself to his brethren; "Blessed are the merciful," &c., by the parable of the good Samaritan; "Blessed are the pure in heart," &c., by Simeon in the presentation of our Lord in the Temple; "Blessed are the peacemakers," &c., by Lot's separation from Abram; "Blessed are they which are persecuted for righteousness," &c., by Joseph in prison. The figures fill up the entire space without any accessary aid of ornament.

St. Clement's Church, Sheepscar.—The west end of this church has, by the kindness of Mr. J. W. Taylor, of Newton Grove, been decorated with a stained window and encaustic tiling. The window is by Mr. Wailes, of Newcastle, who has been employed largely on the windows of Ely Cathedral. It consists of five lights, and is devoted to Old Testament subjects, as the east is to fourteen of the last scenes in the life of our Lord. The subjects are "The Sacrifice of Noah," "Abram and the three Angels," "The offering up of Isaac," "The giving of the Law," and "The Ascension of Elijah." The tracery is filled with the emblems of the twelve tribes and the ark in the centre, while in the two large quatrefoils are Moses and Aaron. Beneath the window was a large mass of walling, but this has now been covered with some encaustic tiling. The whole is a memorial to a daughter of Mr. Taylor. A design has been prepared for the east end to give an opportunity for the exercise of liberality.

Doncaster Parish Church.—In St. George's Church, Doncaster, a new stained-glass window has been erected by Sir Isaac Morley, of Beechfield, to the memory of his wife. The artists were Messrs. Ward & Hughes, of London. The window is the great one situated at the west end of the church. It consists of seven lights, each light containing four distinct representations. The design comprises an illuminated chart of the genealogy of Christ. In the main stem are figures of the fourteen generations of kings and patriarchs, from Jesse to the time of our Lord. The window is designed on the principle of the window in Merevale Abbey. The first of the chief lights contains representations of Jesse, David, Solomon, and Rehoboam. In the second are figures of Abia, Asa, Jehosophat, and Joram. The four subjects in the third are Ozias, Joatham, Achaz, and Ezekias. The representations in the fourth are Manasses, Amon, Josias, and Jechonias. In the fifth are figures of Salathiel, Zorobabel, Abiud, and Eliakim. In the sixth are personified Azor, Sadoc, Achim, and Eluid; and in the seventh Eleazar, Matthan, Jacob, and Joseph. Springing from the upper part of these lights, and forming the top row across the window, is a foliage, embracing the subjects of the Annunciation, the Nativity, the Transfiguration, the Resurrection, and the Ascension, the representation of the latter being supported on either side by an angel.

Kippen Church (Scotland).—The decoration of the side windows of this church with stained glass, in harmony with the two pulpit windows recently presented by Mr. James Scott, has been commenced. The centre window in the north side has been filled in. The window is in two lights, and, in conformity with a complete plan proposed for the illustrations throughout all the windows of the church, represents two of our Lord's miracles. In one light is "The giving sight to the blind man," and the other, "The raising of Jairus's daughter." The window was designed and executed by the firm of James Ballantine & Son, Edinburgh.

Church of Fornham St. Martin.—The latest additions to the numerous painted windows with which this renovated church is now adorned, consists of the insertion of stained glass in one of the windows on the north side of the nave, next the chancel arch, in memory of the first wife of Mr. John T. Ord, of Fornham House. The window consists of two lights, each of which contains a group representing one of our Lord's miracles,—in the one case, the healing of the woman who expressed her faith in the words, "If I may but touch His garment I shall be whole"; in the other, the restoration of sight to the blind beggar Bartimæus. The tracery in the heading of the window is filled with angels bearing scrolls, on which are inscribed the words, "Jesus said, come unto me, all ye that labour and are heavy laden, and I will give you rest." Messrs. Wailes & Son, of Newcastle, executed the windows.

Miscellanea.

The Silber Light.—In reply to the question what is the Silber light, we may state that it consists in the inventions of a Mr. Silber, in the hands of a company called the Silber Light Co., for the improvement of lamps and burners, argand, batswing, &c., so as to secure, as far as possible, the perfect combustion of the material, in mineral and vegetable oil lamps, as well as in gas-jets. Air currents are admitted both into the centre and round the circumference of the flame, in various forms of lamp and burner manufactured by the company; and it is said that thus an argand burner, for example, is got which will burn only 5 ft. of gas per hour, or the usual consumption of a common fishtail burner, while yielding a light equal to twenty-one candles. These improvements are secured, not by complicated arrangements, but simply by constructing the burners so that the material is as completely burned as possible.

The Australian Jarrah Wood. — The "Swan River mahogany" is a species of Eucalyptus (*E. marginata* of Smith) which is restricted to Western Australia. It is thus described in the Journal of the Society of Arts for the 24th ult., which, however, does not state whether this species of Australian Eucalyptus is known to possess the singular sanitary properties of the Eucalyptus globulus, of which some account was given in the *Builder* of the 1st inst., or whether it be the same species. Djaryl or Jarrah is the aboriginal name. It is applicable for furniture and every purpose for which ornamental wood can be required, some of it being of the very finest grain, and showing much figure, mottled curls, feathers, and excrescences, a feature peculiar to colonial wood, and highly effective in point of ornament. The tree grows to an immense size, attains a great height, and is very plentiful. None of the neighbouring colonies possess timber of similar character, or endowed with equally valuable properties. The advantages of this timber are its great strength, hardness, and closeness of grain, combined with durability under exposure to either salt or fresh water. It is never attacked by white ants or by the *teredo navalis*. It somewhat resembles the red gum in appearance. It is invaluable to the Western Australians, who use it for shipbuilding, pier, and railway construction, as well as for the interior of buildings and for furniture. It defies decay; time, weather, water, the white ant, and the sea-worm have no effect upon it. The chief objection raised against it is that it is liable to "shakes," the trees being very commonly unsound at the heart. It will doubtless shortly come into more general use, as two companies have been formed for supplying the market on a large scale, one Indian and the other colonial.

The Periodical Floods in Towcester.—An attempt to get rid of the floods which the river Tove produces in the town of Towcester after heavy rains is about to be made by the parochial sanitary committee, who have adopted a plan suggested by a Mr. Savage and recommended by their medical officer of health, Mr. Haviland. This plan essentially consists in converting the winding course of the stream which causes the floods into a straighter channel. At present the water-way meanders in four S-like loops through the town, and the result in heavy rains is that floods and unwholesome damps pervade the town and diminish its healthfulness. Our readers may recollect of Mr. Haviland in connexion with the important subject of the geographical distribution of disease. "Floods," he remarks in his report on the Towcester question, "are the cause of many diseases,—rheumatism, phthisis, and many pulmonary complaints from dampness,—and I was the first to point out that that dreadful disease, cancer, especially in women kills more persons in the districts subject to floods than in any of the other parts of England."

Amalgamation of the Leeds Schools of Art.—Arrangements have been completed for the amalgamation of the Leeds School of Art and Science, South Parade, with the Leeds School of Art in connexion with the Mechanics' Institute. The desirability of this step has for some time been patent to those cognisant with the matter. Messrs. Nussey, representing the South Parade School, have agreed with the committee of the Leeds Mechanics' Institute School of Art, represented by Mr. John Holmes (chairman), Messrs. Hick, Kempe, Sales, Wardman, and Woodcock, to transfer the pupils in the former school, and the latter agreed to recommend their general committee to appoint Mr. A. Stevenson to be head master of the amalgamated schools.—At a special meeting of the general committee of the Leeds Mechanics' Institute, the report of the School of Art Committee was presented, and agreed upon without a dissentient vote. By this union it is anticipated that there will be a great advance made in the position of the School of Art.

Explosion of Gas.—An explosion has taken place at the Kew Gardens Station of the London and South-Western Railway, doing damage to the extent of about 200*l.* It appears that the head porter had, about ten minutes previously, lighted the gas in the waiting-rooms on the up side, and while another porter was standing on a truck lighting the gas outside an explosion followed, blowing out the windows and doors of both waiting-rooms, and destroying the ceilings. The cause of the explosion was an accumulation of gas in the ceilings.

Education of Children in the City.—A public meeting, called by the Lord Mayor, has been held in the Egyptian Hall, at the Mansion House, for the purpose of considering a scheme for the education of children in the City of London, prepared by a committee, consisting of Sir Sydney Waterlow, Sir J. Bennett, Rev. H. I. Cummins, Rev. W. H. Milman, Mr. S. Morley, M.P., and the Rev. William Rogers, and which involved the amalgamation of the ward, endowed, and national schools, with exceptions, and the erection of three large schools, capable of accommodating 1,000 children in each, in the neighbourhood of Farringdon, Fenchurch, and Moorgate, and under one general Board, with the Lord Mayor at its head. Into the minutiæ of the scheme, however, we need not enter, as an amendment, "That, while thanking the committee for their services, this meeting declines to adopt the scheme suggested," was carried in the face of the scheme by a majority of at least 20 to 1.

The Proposed Byker Bridge, Newcastle-upon-Tyne.—Some months ago, designs of a scheme to bridge the valley of the Ouseburn were prepared by Mr. Thomas Parker, architect, showing on the ground-plan three different lines. A roadway of 30 ft. width is shown in connexion with each, or equal to that, at the High Level Bridge; the shorter line shows a bridge of sixteen arches, making a total length, with approaches, of about 1,500 ft.; whilst the other line requires eighteen arches, of 60 ft. span each, and is, with the necessary approaches, about 2,000 ft. in length. The cost of the scheme, calculated on the basis of the shorter line, and for a brick structure, is estimated at about 40,000*l.* The cost of the longer line, it is considered, would be higher in about the proportion of its greater length of approaches. The provisional committee have referred the matter to Mr. Robert Hodgson, C.E. It is hoped that arrangements may be made to enable the promoters to obtain the necessary powers during next session of Parliament.

Opening the Cottage Hospital at Sevenoaks.—The new hospital which has been erected near the Bat and Ball Station has been formally handed over to the general body of subscribers. The total amount promised or paid has been 1,166*l.*, and the expenditure up to the present time, 1,046*l.*, which includes furnishing, gas-fittings, &c. They had, however, to lay out the grounds, and pay for fencing, which would require about 80*l.* more, but they opened free of debt. At present the annual subscriptions promised amount to 69*l.* 10s. 3d., but the promoters estimate that they will require about 200*l.* a year. A vote of thanks has been given to Mr. Hooker for his gratuitous services as architect. The hospital has been fitted with eight beds, and a small weekly payment, according to the means of the patients will be charged.

The Ryde Water Supply.—A report upon the water supply of Ryde, by Mr. George H. Staton, C.E., the borough surveyor, has been printed by the borough authorities. The report relates to the present and future supply, the constant system supply, extension and renewal of mains, fire arrangements, street-watering appliances, and the costs thereof. The surveyor is of opinion that there will not be any difficulty in obtaining any quantity of water for an increased supply, the only question being the one of expense. The cost of the works he proposes, including a new rising main and additional-service reservoir, will, he estimates, be about 6,800*l.*, involving, if borrowed at 3½ per cent. interest, repayable in fifty years, an annual payment of 289*l.* odd, or a rate of about 1¼d. in the pound per annum.

Fall of Railway Works at Halifax.—A portion, 30 to 40 yards long, of an immense retaining-wall on the Halifax and Ovenden Branch Railway, now in course of construction, has fallen down at the bottom of Lower Wade-street, Halifax. The wall was built in the bed of the Hebble Brook, and behind it was an immense quantity of earth and other *débris*. The wall had been noticed to have given way, but still the permanent way had been laid behind it. By its fall many hundreds of tons of *débris* were let down into the brook, the waters of which were dammed up behind the mill of Messrs. Cockcroft, silk-spinners, which it was feared they would flood. However, the waters were diverted; but it will be weeks before the damage to the wall and earthworks can be made good, and more may give way.

Casket for Sir A. D. Sassoon.—The gold casket presented by the Corporation, with the freedom of the City of London, to Sir Albert David Sassoon, C.S.I., has been designed and executed by Messrs. Howell, James, & Co., of Regent-street. It is designed in the Renaissance style of Art, and executed in 18-carat gold. The body of the casket is supported by four ornamental columns, relieved by panels in *repoussé* and carved gold, each end inclosing a medallion painted in enamel with crest and monogram. The lid is dome-shaped, and surmounted by the arms of the City in gold and enamel.

Charge against Surveyors of Wandsworth District Board of Works.—Charges against these surveyors of having received certain sums of money from contractors to the Board are being inquired into. A committee of the whole Board to go into the matter has been formed. The Clapham local committee reported the resignation of Mr. Trussler, road foreman of the parish. The Board refused to accept the resignation, as he was one of the persons implicated in the pending inquiry.

Earthquake in Sicily.—An earthquake has taken place in Sicily, after twenty-one days' continuous rain. The sulphur mine of Fra Paolo has been completely destroyed. Its value was 300,000*l.* The shafts, galleries, and aqueducts, in operation for fifteen years, all collapsed. The mines of the Giona Sulphur Company have also suffered greatly. Mount Etna is in eruption, the Tiber has overflowed its banks, and the Pantheon is under water. Vesuvius is showing signs of eruption.

Enlargement of the Camberwell Cemetery.—In consequence of the increasing number of interments in the Camberwell Cemetery, near Lordship-lane, Dulwich, it is about to be enlarged, and for this purpose the vestry have agreed to purchase a plot of land adjoining the upper part of the cemetery. This is in addition to another portion of land which has already been purchased on the other side of the cemetery, with a view of carrying out the enlargement.

A Case against Workmen dismissed.—A complaint made by Messrs. Chubb & Son, the lock manufacturers, against two of their men, for absenting themselves from work, was decided at Lambeth in favour of the defendants. It appeared that these men had been in the habit of keeping "Saint Monday," but as it was admitted that they afterwards returned to their duty, and also that deductions from their wages were made for all absences, the magistrate said that the summons must be dismissed.

Outbreak of Typhoid in Wellington.—Typhoid fever is reported to have broken out in the neighbourhood of Wellington, Herefordshire. No fewer than thirty cases have been traced to impregnation of well-water, and it is said the district is not only almost without natural, but devoid of artificial, means of drainage. Dr. Sandford, who has reported on the outbreak, describes the contamination by sewage as "something fearful to contemplate."

The National Safe Company's Premises. The first stone of this building, of which we have already given some particulars, has been laid. In the course of the excavations for these offices, at the north-western corner of Walbrook, a considerable number of antiquities were discovered and preserved, and are described in a quarto book issued by the Company, some account of which we will give on another occasion.

Patents for Inventions for the Year 1872.—The number of applications for letters patent recorded within the year 1872 was 3,970; the number of patents passed thereon was 2,771; the number of specifications filed in pursuance thereof was 2,734. The aggregate surplus income from patent fees on balance of accounts from the 1st of October, 1852, to the end of the year 1872, amounts to the sum of 1,012,928*l.*

The Artizans', Labourers', and General Dwellings Company.—This Company's new houses, Lecture-hall, and Working Men's Institute, on the Shaftesbury Park Estate, Lavender Hill, Wandsworth-road, were opened on Monday last, November 3rd. Lord Shaftesbury delivered an opening address, and some other gentlemen took part in the proceedings. We will make an opportunity to look over the place quietly.

St. Pancras.—Mr. E. W. Hudson has resigned the office of assistant surveyor to the St. Pancras Board of Works.

New Park for Sheffield. — The Town Trustees of Sheffield decided to purchase twenty acres of land in the outskirts of the town for the purpose of a park and recreation-ground. The cost is 14,000*l.* A few months since the corporation of Sheffield purchased a park at a cost of 18,000*l.*, and the land to be purchased by the town trustees is in close proximity to it.

London Tramways.—Speaking in our last of the number of persons using public conveyances in London, the writer, by an inadvertence, made the transport of 100,000,000 persons at 2d. each amount to 16,666,666*l.* instead of 833,333*l.* In working out the sum, shillings were called pounds.

Want of a Mortuary for Battersea.—At the last meeting of the Wandsworth Board of Works, attention was called by Dr. Kempster to the want of a mortuary for Battersea. The need of such a building is admitted, and it has been decided to refer the subject to the Battersea Local Committee for inquiry and report.

Close of the International Exhibition.—The third of the series of annual International Exhibitions, held at South Kensington, has come to a close, without form or ceremony of any kind. The Exhibition has not been without some useful results.

Close of the Vienna Exhibition.—This Exhibition was closed by two of the archdukes, without ceremony. On the southern terrace, three large military bands played the National Anthem. This was followed by cheers from the thousands of persons present.

Railway Station, Bristol.—The tender of Mr. Jonathan Marshall, contractor, of Plymouth, has been accepted by the Joint Railway directors for the second and main portion of the new general station at Bristol, the first of which he has now in course of completion.

Transit of Animals.—The Royal Society for the Prevention of Cruelty to Animals offer premiums amounting to 400*l.* for improved cattle-trucks. The conditions will be found in our advertising columns, and ought to produce competitors.

TENDERS

For repairs to twelve houses, Union-road, Southwark. Messrs. Jarvis & Son, architects:—

Shepherd	£500	0	0
Lacy	410	0	0
Kent	250	0	0

For erecting and completing new premises, Nos. 12 and 13, King-street, Covent-garden, for Messrs. Barr & Sugden. Messrs. Spalding & Knight, architects. Quantities by Mr. G. Fleetwood:—

Downs & Co.	£6,210	0	0
Patman & Fotheringham	5,894	0	0
Scrivener & White	5,390	0	0
Boyce	5,370	0	0
Macey	5,314	0	0
Browne & Robinson	5,131	0	0
Sheppard	4,971	0	0

For repairs to Clifton House, Dalston, and erecting two shops in front of the same, and building two houses and shops adjoining, for Messrs. Puckeridge & Nephew. Mr. Joseph Tanner, architect:—

Turner & Son	£3,590	0	0
Devereaux	3,334	0	0
Mann & Son	3,290	0	0
Larke	3,170	0	0
Mustoe & Son	3,048	15	0

For erecting new carpet showrooms, for Messrs. Maple & Co., in Grafton-street East, W. Mr. H. Woodzell, architect:—

Carter & Son	£5,700	0	0
Holland & Hannen	5,687	0	0
Newman & Mann	5,582	0	0
Colls & Sons	5,540	0	0
Browne & Robinson	5,516	0	0
Fish	5,496	0	0
Cooke & Green	5,494	0	0
Longmire & Burge	5,490	0	0
Manley & Rogers	5,476	0	0
Scrivener & White	5,346	0	0

For new church in Mare-street, Hackney. Mr. J. Drake, architect. Quantities supplied by Messrs. Goodman & Vinall:—

Stephenson	£4,422	0	0
Dove, Bros.	4,175	0	0
H. J. Turner	3,950	0	0
C. R. Turner	3,850	0	0
Carter	3,840	0	0
L. H. & R. Roberts	3,798	0	0
Groome	3,783	0	0
Cooke & Co.	3,771	0	0
Greaves (too late)	3,636	0	0
Blackmore & Morley	3,613	0	0
Niblett & Son	3,490	0	0
Norris, jun.	3,475	0	0
Chinnock	3,368	0	0
Robbins & Co.	3,220	0	0